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Immunology of Graft Rejection

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Background: Transplantation is the act of transferring cells, tissues, or organs from one site to another. The malfunction of an organ system can be corrected with transplantation of an organ from a donor. The immune system has developed elaborate and effective mechanisms to combat foreign agents. These mechanisms are also involved in the rejection of transplanted organs, which are recognized as foreign by the recipient's immune system. Understanding these mechanisms is important, as it aids in understanding the clinical features of rejection, and hence, in making an early diagnosis and delivering appropriate treatment. Knowledge of these mechanisms is also critical in developing strategies to minimize rejection and in developing new drugs and treatments that blunt the effects of the immune system on transplanted organs, thereby ensuring longer survival of these organs. The degree of immune response to a graft depends partly on the degree of genetic disparity between the grafted organ and the host. Xenografts, which are grafts between members of different species, have the most disparity and elicit the maximal immune response, undergoing rapid rejection. Autografts, which are grafts from one part of the body to another, are not foreign tissue and, therefore, do not elicit rejection. Isografts, which are grafts between genetically identical individuals, also undergo no rejection. Allografts are grafts between members of the same species that differ genetically.

Objective: To survey types of immune response against a transplant.

Result: In this study we understand that immune system reaction to foreign tissue and the degree of this response depends on foreignicity of tissue to recipient.

KEYWORDS: Transplantation; Immune system; Types of graft; Graft rejection

Pharmacokinetics of Tacrolimus in Stable Liver Graft Recipients

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Background: Liver transplantation is the treatment of choice for end-stage liver disease (ESLD). However under certain circumstances, it still has challenges. Tacrolimus are used widely after liver transplantation to prevent allograft rejection.

Objective: To determine the pattern of pharmacotherapy in stable liver graft recipients.

Methods: 39 stable liver transplant recipients were studied. Concentration of tacrolimus was measured by microparticle enzyme-mediated immunoassay technique. Pharmacokinetic variables were derived using STRIPE. Clinical and pharmacological data were recorded in MS Excel and analyzed by SPPSS for Windows.

Results: There was 1.7-fold increase in dose-equalized median blood tacrolimus levels from 2.1 mg/L (pre-dose) to 3.5 mg/L at 3 h before returning to the baseline concentration (2.1 mg/L per mg dose) at 10 h. There was no correlation between absolute AUC in the 39 patients; the tacrolimus dose they received in mg ($r=0.242$, $p=0.098$) or in mg/kg body weight ($r=0.186$, $p=0.206$).

Conclusion: Optimal dosing in the individual patient should be achieved by the inclusion of therapeutic drug monitoring (TDM), as an essential component of the patients' long-term management.

KEYWORDS: Stable; Pharmacokinetic; Tacrolimus, liver; Transplantation

Closure of Huge Alveolar Cleft in Adult Patients with Submental Artery Osteomyocutaneous Island Flap

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Background: Closure of huge alveolar cleft surrounded by fully erupted permanent dentition in the adult patients with cleft is a challenge. In such cases, bone graft exposure due to inadequate soft-tissue coverage is the main cause of graft failure.

Objective: To present the feasibility of reconstructing large alveolar cleft with a pedicled osteomyocutaneous submental flap.

Methods: Two 19- and 26-year-old men with large alveolar cleft are presented. The younger patient had a history of alveolar graft failure due to bone graft exposure. A pedicled osteomyocutaneous submental island flap was used to reconstruct the defect. An inferior marginal mandibular bone section was incorporated with the flap and fixed by miniplate and screws.

Results: The results were satisfactory in both patients who underwent surgery, according to the criteria for coverage of the defect, aesthetics and functionality.

Conclusion: This is the first case report of an osteomyocutaneous submental flap for reconstruction of huge alveolar clefts.

KEYWORDS: Island flaps; Maxillomandibular reconstruction; Alveolar cleft; Bone reconstruction; Submental flap

Serology of Hepatitis E in Patients Undergoing Kidney Transplantation

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Background/Objective: Hepatitis E virus (HEV) has caused many acute hepatitis epidemics in developing countries. Considering the high prevalence of transaminitis on early stages after renal transplantation and the uncertainty of the hepatitis E's role, we evaluated serology of hepatitis E in this high risk group.

Methods: 110 patients were evaluated. After kidney transplantation, anti-HEV IgG levels were measured by ELISA. BUN and creatinine levels after renal transplantation, AST, ALT, alkaline phosphatase, and estimated glomerular filtration rate (eGFR) in the first week, and the first, third, and sixth months after renal transplantation were measured.

Results: HEV Ab of 23 patients was higher than 1.1; they were considered seropositive for HEV. Liver and renal function tests in different periods in patients with HEV Ab higher and lower than 1.1, showed no significant difference. In this study, there was no significant correlation between the levels of creatinine, AST, ALT, and alkaline phosphatase at various periods in patients with HEV Ab higher and lower than 1.1. In patients with HEV Ab <1.1, there were significant inverse relationships between HEV Ab and GFR in the first ($p=0.047$, $r=-0.21$), third ($p=0.04$, $r=-0.20$), and sixth ($p=0.04$, $r=-0.22$) months after renal transplantation. A significant direct correlation was observed between age and HEV Ab levels ($p=0.001$, $r=0.33$).

Conclusion: Our findings showed a high prevalence of seropositivity of Anti HEV IgG in patients receiving renal transplants. However, liver and renal function test results were not significantly different between seropositive and seronegative recipients within 6 months of renal transplantations.

KEYWORDS: Hepatitis E; Kidney transplant; Creatinine; Alanine aminotransferase; Aspartate aminotransferase; Alkaline phosphatase

Non-Occlusive Mesenteric Ischemia after Renal Transplantation

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Background/Objective: Non-occlusive mesenteric ischemia (NOMI) is a mesenteric circulatory disorder defined as diffuse intestinal ischemia in the presence of a patent arterial trunk. Immediate diagnosis and effective management of this condition is of great importance because misdiagnosis would result in a high mortality rate. However, early diagnosis is still a challenging problem. End-stage renal disease (ESRD) is also a risk factor for NOMI but there are only few cases of NOMI in renal transplant patients reported in the literature.

Case Report: A 51-year-old man, a known case of ESRD with unknown etiology who was managed with hemodialysis for 60 months, underwent deceased-donor kidney transplantation. He did not have any history of medical diseases. The donor was a 45-year-old man who had developed brain dead in a car accident. Panel reactive antibody (PRA) was 5% and lymphocyte cross-match test was negative. During operation, we did not meet any complications including hypotension peri-operatively. The immunosuppressive regimen was cyclosporine, mycophenolate mofetil and prednisolone on post-operative period. On post-operative day (POD) 3, the patient complained of abdominal pain with localized guarding in epigastric and RUQ regions. WBC count was highly increased, urinary output was dropped to 50 mL/h, and serum creatinine level raised to about 3 mg/dL. Emergent ultrasonography showed free fluid in the abdominal cavity; plain radiography also showed air under diaphragm. Emergency laparotomy was performed due to vital sign instability. During surgery, ischemic necrosis of a segment of small intestine was seen but the inferior and superior mesenteric arteries did not have any occlusive lesions. The necrotic segment was removed and

end ileostomy was established. Histopathological evaluation revealed necrotic intestine without evidence of vascular thrombosis or vasculitis. Post-operative period was uneventful. Urine output was about 50-60 mL/h and serum creatinine dropped to 1 mg/dL. The patient was discharged on POD 15. The ileostomy was closed 3 months after the last surgery. The patient at present maintains normal renal graft function with no gastrointestinal symptoms.

Conclusion: After kidney transplantation, NOMI is a rare condition, but it should be considered in patients with abdominal symptoms and mentioned risk factors. The physician should be able for early diagnosis and treatment of this rare and potentially fatal condition.

KEYWORDS: Renal transplantation; Vascular complications; Surgery complications

Inducible Expression of Indoleamine 2,3-Dioxygenase Attenuates Acute Rejection of Tissue-Engineered Lung Allografts in Rats

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Background: Lung disease remains one of the principal causes of death worldwide and the incidence of pulmonary diseases is increasing. Complexity in treatments and shortage of donors lead us to develop new ways for the treatment of lung diseases. One promising strategy is preparing engineered lung for transplantation. Due to difficulties in transplant rejection and systemic impact of the use of immunosuppressive drugs which cause side effects such as serious infections and malignancies, employing new immunosuppressive strategies that suppress immune system locally rather than systemically, improves transplant survival.

Objective: In this study we produced rat lung tissues with the help of decellularized tissue, differentiating medium and rat mesenchymal stem cells.

Methods: Transduction of these cells by IDO expressing lentiviruses provides inducible and local expression of this gene. To examine immunosuppressive properties of IDO expression by these tissues, we transplanted these allografts into rats and subsequently evaluated cytokine expression and histopathological properties.

Results: Expression of inflammatory cytokines, IFN γ and TNF α , was significantly downregulated in IDO expressing allograft. Moreover, acute rejection score of this experimental group was also lower compared to other two groups. mRNA levels of FoXP3, a regulatory T cell marker, were upregulated in IDO expressing group. However infiltrating lymphocyte counting did not show significant difference between groups.

Conclusion: This study demonstrates that IDO gene transfer into engineered lung allograft tissues significantly attenuates acute allograft damage suggesting local therapy with IDO as a strategy to reduce the need for systemic immunosuppression and thereby its side effects.

KEYWORDS: Immunosuppression; Lung transplantation; Engineered lung; Indoleamine 2, 3-Dioxygenase

Transplanting Steatotic Livers: Which Factors Associated with Dismal Outcome?

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Background: Available liver grafts are by far less than the number of patients waiting for transplantation. That is why transplant community accepted using Extended Criteria Donor (ECD) grafts, but the problem remaining is that a precise, reliable and reproducible characteristic of these grafts is not available up to now.

Methods: From November 2012 to October 2014, 70 ECD grafts were used out of 906 liver transplantations performed. Donor criteria, graft criteria and recipient criteria were analyzed. Primary non-functioning graft, delayed functioning graft and 3 to 6 months post-transplant graft functions were also analyzed.

Results: The overall incidence of primary non-functioning graft was 11.9%; the incidence of delayed functioning graft was 7.5%; retransplantation incidence was 4.5%; early mortality rate was 17.9%. None of the donor criteria studied was found significantly associated with primary non-function or delayed function of the graft. Moderate macrovesicular steatosis (30%-60%) was not found significantly associated with PNF or DFG. MELD score in recipients was not significantly associated with PNEG or DFG.

Conclusion: Transplanting moderate steatotic livers (30%-60%) are worthwhile and save lives of patients waiting a long time for good livers. Rejection of ECD grafts for transplantation should be based on transplant surgeon examination of the liver. No specific allocation of ECD grafts for high, moderate, or low MELD score recipient could alleviate post-operative course. However, offering these grafts to high MELD score patients is justified.

KEYWORDS: Liver transplantation; MELD score; Steatohepatitis; Fatty liver; Extended criteria donor grafts

Protective Effects of Allopurinol and Captopril in Warm Ischemic Damages on Dog's Kidney

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Background: Captopril and allopurinol can affect kidney in different ways during warm ischemia and improve its function due to acute tubular necrosis (ATN).

Objective: To study the protective effects of captopril and allopurinol on warm ischemic kidney's damage in an animal model.

Method: By surgery on 15 healthy male dogs, we created warm ischemia by bilateral renal artery clamping for 1 hour; then, the left kidney was reperfused for 15 min; after that the left nephrectomy was performed. Right kidney was saved for evaluating the amount of ischemia. The dogs were divided into 3 groups. In the first group, 5 dogs took 1 mg/kg captopril before and after the surgery. The second group dogs took 10 mg/kg allopurinol; and the third group received no drug (control group). Then, plasma BUN and creatinine levels were measured before and 1, 3, 5, 10, and 16 days after the surgery.

Result: Plasma BUN and creatinine levels were elevated in all groups. However, in the captopril group this elevation was significantly lesser than the control group ($p < 0.05$). In the allopurinol group, plasma creatinine level elevation was significantly lesser than the control group ($p < 0.05$). However, elevation of plasma BUN was not significantly different from that in the control group.

Conclusion: Performing 1 hour warm ischemia in dog's kidney resulted in ATN. Although administration of allopurinol and captopril could not prevent ATN, administration of these drugs may result in reducing renal damage and improve kidney function after warm ischemia.

KEYWORDS: Renal transplantation; Warm ischemia; Ischemic time; Acute tubular necrosis

Efficacy of Story Telling in Decreasing the Depression, Stress, Behavioral Problems, and Physical Disorders in Children Candidates for Transplantation

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Background: Transplantation in children may result in mental problems such as stress and depression. Therefore, it is highly necessary to pay more attention to the psychological approach and more emotional supports from these special children before the operation.

Objective: To study the effect of story-telling on decreasing the depression, stress, behavioral problems, and physical disorders in children candidates for transplantation.

Methods: 30 volunteered children were studied. They were divided into two groups of equal size. The research plan was based on the post-test and pre-test method on the control group. The research tool was the Seatel personality questionnaire (SPQ). Teaching interference was performed on the experimental group during eight 60-min sessions. MANCOVA was used for data analyses.

Results/Conclusion: The results showed that the psychological interferences method such as story-telling resulted in highly mental health improvement and decreased stress, depression, behavioral problems and physical disorders in children candidates for transplantation.

KEYWORDS: Story-telling; Mental health; Transplantation, children

Epidemiology of Viral Infections in Kidney Graft Recipients in Montaserieh Hospital of Mashhad

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Background: Viral infections are known as a major cause of mortality after renal transplantation.

Objective: In this study, we assessed the incidence rate, risk factors, and complications of viral infections after kidney transplantation.

Methods: This retrospective study was performed during 2012-2014 in Montaserieh Hospital, Mashhad, northeastern Iran. Medical records of 193 patients were studied. Patients did not receive any prophylaxis against viral infections such as cytomegalovirus (CMV) and varicella-zoster (VZ).

Results: 93 (49.7%) kidney transplant recipients developed 160 episodes of infection. The incidence rate of viral infection in kidney recipients, who did not have received any prophylaxis, was 30%. CMV (22.5%), VZ (3.75%), herpes simplex (2.5%), and BK virus infection (1.25%) were the most common viral infections in kidney transplant recipients.

Conclusion: Viral infection was common following kidney transplantation, particularly in those who do not receive prophylaxis.

KEYWORDS: Viral infection; Kidney transplantation; Prophylaxis

Rate of Infectious Complications Occurring in Kidney Graft Recipients in Mashhad from 2013 to 2014

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Background: Renal transplant is one of the best ways to extend life of patients with end-stages renal disease (ESRD). Many factors, such as serious infections, can affect successful renal transplantation.

Objective: To determine frequency, risk factors, causative pathogens, and clinical profiles of kidney recipients in Mashhad, northeastern Iran, during the first year after renal transplantation.

Methods: This study was conducted in Montaserie Hospital, affiliated to Mashhad University of Medical Sciences, during March 2013 to July 2014. All studied cases were followed for one year. 193 kidney recipients, included 118 males (61.1%) and 75 females (38.9%), with a mean±SD age of 34.4±14.2 years, were enrolled in this retrospective study. There were 58 kidney transplantations from living donors (30.1%) and 135 from cadaver (69.9%).

Results: 160 infectious episodes occurred in 96 patients. The most common infection site was urinary tract (36.8%). *Escherichia coli* and cytomegalovirus (CMV) were the most frequent isolated pathogens.

Conclusion: Infections are highly prevalent during the first year post-transplantation. Prevention and effective antibiotic therapy will decrease these complications.

KEYWORDS: Renal, transplantation; Infection

Causes of Family Refusal for Organ Donation in Mashhad University, Mashhad, North East of Iran

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Background: Cadaveric organ donation in the developed world has not increased appropriately with the number of brain-dead cases. Despite the high rate of brain death in Iran, many families do not permit organ donation.

Objective: To determine causes of refusing organ donation from brain dead patients in Organ Procurement Unit (OPU) of Mashhad University, Mashhad, North East of Iran.

Methods: This was a cross-sectional study on brain dead patients' files referred to OPO center affiliated to Mashhad University of Medical Sciences during 1997-2013. The information on age, sex, cause of brain death, and the process of obtaining consent from relatives were collected from records existed in the center. 1012 patients with confirmed brain death were introduced to the center during these years. The collected data were analyzed by SPSS.

Results: Among all the brain-dead patients, only 739 (52.7%) patients had proper conditions for organ donation. The rate of organ donation was increased during study period from 41.85% at the beginning to 61.2% at the end of the study. The most important reasons of relatives for disagreement with organ donation were not believing the brain death (20.1%), fear of donating organ to other coreligionists (8.1%), fragmentation and deformation of the body (4%), and believe in miracle (12%).

Conclusion: It seems that in many developing countries, like Iran where people have special beliefs about death, with proper care and better identification of brain-dead patients, there will be no need to organ donation from live donor and DCD. Performing intervention for increasing knowledge and changing attitude of health care personnel towards organ donation from brain death patients is necessary.

KEYWORDS: Organ donation; Organ transplantation; Brain death

Evaluation of Blood Donors' Knowledge about Organ Donation from Live and Cadaver Donors in Mashhad During 2014-2015

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Background: Knowledge and attitude of people towards organ donation are contributory factors to encourage them to donate organ. Lack of public awareness from need for organs, is one of the major causes of shortage of volunteers. Cognition of organ donation barriers will improve organ donation procedure and remove barriers. Evidence shows that public training is effective for solving this problem.

Objective: To assess blood donors' knowledge and attitude towards organ donation from cadaver and live donors, in Mashhad, northeastern Iran.

Method: This cross-sectional study was conducted on blood donors who referred to Mashhad Blood Transfusion Centers during 2014-2015. 640 donors were asked to complete a questionnaire.

Results: 55.2% and 35.7% of studied participants believed that organ donation from live donors and brain-dead patients are acceptable in certain circumstances, respectively. When they were about their willingness to donate their organs if they found brain-dead, 55% and 19.8% agreed to donate their own and their relatives' organs, respectively. Of those who disagreed to donate organ, 43% did not mention any special causes.

Conclusion: In contrast to the results from other studies conducted elsewhere, in this study, tendency of donation from lives individuals were more than brain-dead patients.

KEYWORDS: Organ donation; Brain death; Live donor

Urinary Tract Infection in Kidney Transplant Recipients

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Background: Urinary tract infection (UTI) is a common infectious complication after kidney transplantation.

Objective: To evaluate the clinical feature and causative pathogens of UTI among kidney transplant recipi-

ents.

Methods: We evaluated 59 episodes of 43 recipients with confirmed UTI who underwent kidney transplantation during 2013-2014 at Montaserie Hospital, affiliated to Mashhad University of Medical Sciences. Medical records of the patients were reviewed retrospectively.

Results: Bacterial infection was the most common etiology. *Escherichia coli* was isolated in 32 (54%), *Klebsiella* in 10 (17%), *Staphylococci* coagulase-negative in 9 (15%), *Streptococcus* in 4 (7%), fungus in 3 (5%) and, other species in 1 (2%) recipients.

Conclusion: UTI is a frequent complication after kidney transplantation. *E. coli* was the predominant pathogen in our study. Infection control measures can decrease the incidence of bacterial infections.

KEYWORDS: Urinary tract infections; Kidney transplantation; Infections

Nutritional Status in Children who Underwent Hematopoietic Stem Cell Transplantation

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Background: Hematopoietic stem cell transplantation is a highly catabolic treatment with a high risk of toxicity and complications, mainly appearing in the gastrointestinal tract. Assessment of nutritional status should be an integral part of patient care. Much more than adults, children who undergo this type of transplantation are at risk of clinical depletion, because they have limited body reserves of fat and protein, higher energy expenditure, and increased energy requirements for growth and development in the recovery phase. The procedure decreases oral intake to a large extent and causes malabsorption of nutrients, thus compromising a patient's nutritional status.

Objective: To conduct a systematic review on assessing nutritional status in children who undergo hematopoietic stem cell transplantation.

Methods: A literature search was carried out based on a Medline search of published retrospective, not-controlled prospective and current guidelines and recommendations on nutritional status evaluation in children with hematopoietic stem cell transplantation. A search on standard textbooks and review articles on this issue was considered as well. Summary and nutritional recommendations from the literature for these patients will be discussed in this review.

Results: Assessment of the nutritional status before transplantation should be considered as per different parameters: general evaluation (including dietary and medical history and physical examination), anthropometric data (body mass index), assessment of body composition, measurement of nutrient balance and laboratory studies including albumin and prealbumin, Buzby's index, and weight loss during the 6 months before transplantation. The nitrogen balance is considered the most sensitive method for assessing the nutritional status of these children, which shows the existing imbalance between protein catabolism and anabolism. With prolonged TPN periods, gastrointestinal mucosal changes with the atrophy of villi and their immune function appear, inducing an increase in bacterial translocation and thus producing a new source of infection. Therefore, nutrition by the oral route should be conserved when possible to help intestinal trophism. In addition, due to the induced severe neutropenia, the oral feeding should be a low bacterial regimen to prevent the transmission of infectious agents. Therefore, the recommended diet for these patients is the so-called low-bacteria diet, which should be prescribed considering the capacity and preferences of each patient, to optimize oral intake. In these patients, it is necessary to include parenteral nutritional support according to protocol to supplement a deficient oral intake.

Conclusion: The main recommendations for nutritional support in bone marrow transplant patients are: (1) Nutritional evaluation and monitoring may be proposed to bone-marrow transplant recipients; (2) Body

weight assessment and percent of weight loss evaluation; (3) Nutritional monitoring should include daily weight monitoring, clinical monitoring of hydration and assessment of daily dietary intake; (4) Artificial nutrition is recommended in bone marrow transplant patients; (5) Intravenous hydration and oral nutrition can be proposed to bone-marrow transplant recipients; (6) There is no standard modality for artificial nutrition; Exclusive enteral or parenteral nutrition and enteral plus parenteral nutrition may be proposed; (7) Lipid intake representing up to 30% of the non-protein caloric intake should be supplied; (8) Oral supplements with nitrogen substrates or glutamine is not recommended. Parenteral glutamine supplements may be proposed.

KEYWORDS: Bone marrow transplantation; Nutritional status; Children

The Relationship Between Cytomegalovirus Infection and Acute Rejection in Kidney Transplant Recipients

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Background/Objective: Cytomegalovirus (CMV) infection is a common problem among kidney transplant recipients. This infection can be increased morbidity and decreased graft survival. This problem has been associated with acute rejection.

Methods: 130 renal transplant patients were included in a prospective, single-center study. The patients were divided into two groups: "patients group" with CMV infection, and "control group" without CMV infection. Serum CMV-IgG in all patients was positive (donor and recipients). No patient received thymoglobulin and anti-thymocyte-globulin. CMV infection was diagnosed by quantitative CMV-PCR test (>500 copies/ μ g). Rejection episode was defined by kidney isotope scan or biopsies.

Results: In a group of 66 CMV-infected patients (25 female [38%] and 41 males [62%]), the incidence of graft rejection was 36%; in the control group (n=64), the incidence was significantly ($p<0.005$) lower (1.5%).

Conclusion: CMV infection is a risk factor for acute rejection in renal transplant recipients. The results of this study suggest that factors controlling CMV infection can reduce episode of acute rejection.

KEYWORDS: Cytomegalovirus infection; Acute rejection; Kidney transplantation

Oral Chronic Graft-versus-Host Disease: Clinical Features and Management

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Background: Chronic graft-versus-host disease (cGVHD) is a late complication of allogeneic hematopoietic stem cell transplantation (HSCT), occurring in 18% to 70% of recipients. The oral tissues can be affected in up to 90% of patients with cGVHD in their other organs. Oral mucosal lesions and salivary gland dysfunction are the main manifestations of oral cGVHD, but a reduction of the mouth opening due to the perioral depo-

sition of collagen may also occur. According to the US National Institutes of Health (NIH), the oral features of cGVHD may be classified as diagnostic form (lichen planus-like changes, hyperkeratotic plaques, and reduction in mouth opening), distinctive form (xerostomia, mucocoeles, mucosal atrophy, pseudomembranes, and ulcers), and also a common form in both acute GVHD and cGVHD (gingivitis, mucositis, erythema, and pain). Indeed, the oral cavity may be the only affected location in cGVHD. The diagnosis is established based on clinical characteristics, though confirmation through biopsy study is sometimes needed. The mainstay of topical therapy in the management of symptomatic oral cGVHD is steroid preparations formulated in a variety of carrier or instrument including gels, ointments, and rinses with varying potency offering overall response rates about 5%. Extracorporeal photopheresis and systemic corticosteroids constitute second line treatment. Oral cGVHD is not considered a determinant for patient survival; this rate after 5 years of diagnosis is approximately 52%.

Objective: To offer a practical update on oral cGVHD, regarding diagnosis and treatment.

KEYWORDS: Graft-versus-host; Oral, diagnosis; Treatment

Oral Care and Dental Management before Bone Marrow Transplantation

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Background: Perhaps bone marrow transplantation (BMT) is the most hazardous procedure among all tissue transplantations. Oral care protocols and dental management are of great important as well. Oral care of these patients should be considered before the transplantation. Bone marrow pathologies place the patient in danger of infection and bleeding, which must be mentioned in dental treatment planning. All sources of potential or active infection must be eradicated to revoke any need for aggressive procedures in post transplantation period (particularly within the first 6 months) due to great susceptibility to infection and hemorrhage. Dental treatments should be avoided in post-transplantation period due to malaise, drug interference, and risk of aspiration pneumonia. Rigorous advice to oral health maintenance is essential and is difficult in those with poor oral health condition. It will be problematic to be conservative in planning treatment in patients undergoing BMT because of short time and questionable treatments can jeopardize patient. Considering previous treatments and attitude toward keeping teeth, financial problems and tolerance of complicated treatments are other important issues.

Objective: In this presentation various aspects of oral care and dental management before BMT are discussed.

KEYWORDS: Bone marrow transplantation; Oral care; Dental management

History of Organ Transplantation in the World and Iran: A Review

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Background: Increasing development of new medical revitalization has created resuscitology that saves thousands of lives. In recent years, thanks to medical progress and improvements in microscopic proce-

dures, the success rate of transplantation surgery has improved dramatically. The science of organ transplantation in the past decade has witnessed significant developments that could be considered a turning point in the history of the profession.

Objective: In this presentation, we review the history of organ transplantation in Iran and the world.

Methods: To access an extensive search in database and Web-related articles and Web sites, different keywords "transplant," and "history" was used. Finally based on relevance of articles on the subject of research and expert opinion, resources were selected.

Results: Organ transplantation has been one of the most advanced treatments during the last 60 years. The first organ transplantation was done by Roman saints in the third century. Alex Karrel (1912) won Nobel prize for inventing the technique of suturing blood vessels and transplanted organs. The first successful kidney transplant by Joseph Murray was awarded in 1954; it was done between two twin brothers. The first organ transplant from a dead human was done in 1963. The first kidney and pancreas transplant was done in 1996; the first heart transplant was done in 1967. History of organ transplant in Iran is 40 years. From 15 years ago, the concept of organ transplant approval of organ donation has seriously been organized. The first kidney transplant was performed in 1967 in Shiraz. There are 25,000 patients in need of organ in the country, 7-10 of whom die every day. During the past decade, 4000 transplantations have been done in Iran. It is the first place for live kidney transplantation and the third place in bone marrow in the world. 34,166 kidney transplantations have been done as the end of 2012.

Conclusion: The branches of organ transplantation have been affected by changes in the culture and political developments. Preservation of donor organs, surgery, immunology, immunosuppression drugs, and control of infectious diseases have had a significant improvements. In future, transplantation of xenografts from animals to human becomes a possibility. That could be a temporary solution to make organ transplants available.

KEYWORDS: Transplantation history; Organ transplantation

Gallstone Disease in Patients Undergoing Kidney Transplantation

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Background/Objective: Screening for gallstones in patients who are in waiting list for transplantation is advised by many authors; prophylactic cholecystectomy in patients with gallstone has been recommended by some surgeons before renal transplantation.

Methods: We reviewed our clinical results of laparoscopic cholecystectomy in our candidate patients for renal transplantation (renal group) and compared them with the results from other patients who required laparoscopic cholecystectomy (normal group).

Results: The renal group had a 14.5% incidence rate of minor complications without major complications and deaths; the normal group had a 13.8% incidence rate of minor complications without major complications and deaths. Renal group patients had a hospital stay more than the other group.

Conclusion: Laparoscopic surgery of the gallbladder is safe with acceptable risk and does not represent complications more than other patients who undergo other types of laparoscopic surgeries.

KEYWORDS: Gallstones disease; Kidney transplantation

Association of Metabolic Syndrome and Serum Vitamin D Levels in Kidney Transplant Recipients

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Background: Metabolic syndrome (MS) is a collection of known cardiovascular risk factors including hypertension, dyslipidemia, truncal obesity, and impaired glucose tolerance. Vitamin D is one of known lipophilic hormones that have major effects on the homeostasis of calcium and phosphorus. There are reports in general population showing low serum 25-OH D3 levels may be associated with higher prevalence of MS.

Objective: As MS reduces graft survival after transplantation, this study aims to find relationship between vitamin D deficiency and metabolic syndrome on kidney transplant patients.

Methods: We performed a cross-sectional study from October 2014 to March 2015, on 86 stable renal transplant recipients to detect relation between serum vitamin D level and MS. This syndrome was diagnosed according to the Asian National Cholesterol Education Program-Adult Treatment Panel III (NCEP-ATPIII) criteria. Patients with previous history of diabetes mellitus, malabsorption syndrome, chronic diarrhea, and ileostomy, and those with recent use of oral or injection of vitamin D products, anti-convulsants, and alcohol were excluded from the study.

Results: There were 43 patients in each group with and without MS. 30 of them (70%) had three diagnostic criteria of MS; 13 (30%) had four criteria. Totally, they were 48 (56%) males and 38 (44%) females. The mean age of those with MS was significantly higher than those without MS. There was no significant difference between mean serum creatinine and GFR between the two groups. Those with MS had higher weight and body mass index (BMI) ($p < 0.05$) compared to those without MS. The prevalence of BMI > 25 kg/m² in MS group was 54% vs. 33% in non-MS group ($p < 0.05$). In MS group 64.3% of patients had vitamin D deficiency, 21% had vitamin D insufficiency and 14% had sufficient level of vitamin D. The rates in non-MS group were 49%, 30%, and 21%, respectively. Although the prevalence were higher in MS group, the difference was not significant.

Conclusion: It seems that MS are commonly associated with vitamin D deficiency in kidney transplant recipients and correction of this vitamin deficiency may prevent MS and its side effects and thus increase graft survival.

KEYWORDS: Vitamin D; Metabolic syndrome; Kidney transplantation

Knowledge and Attitudes of Bojnourd Citizens about Brain Death and Organ Donation in 2014

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Background: Brain-dead patients are not salvageable. While the number of patients who need organ transplantation is increasing, the shortage of organ donors remains significant.

Object: To determine the knowledge and attitudes of Bojnourd citizens towards brain death and organ donation.

Methods: In this cross-sectional study, conducted between March and August 2014, 380 Bojnurd citizens were selected through multistage sampling method. The tool was a self-structured questionnaire consisting three parts: demographic, knowledge, and attitude towards organ donation. The questionnaire was validated by content validity method and was made reliable by Chronbach's α method.

Results: 55 of citizens were female. The mean \pm SD age of participants was 29.9 \pm 9.3 years. The majority of citizens had moderate levels of knowledge; most of them did not have a positive attitude towards organ donation. Citizens with poor attitudes had lower knowledge ($p=0.047$).

Conclusion: The majority of citizens had negative attitudes towards life-giving organ donation; therefore public education in order to correct the beliefs, develop positive attitudes and increase the knowledge of them is essential.

KEYWORDS: Organ transplantation; Brain death; Knowledge; Attitude

Extra-Pulmonary Tuberculosis in a Renal Transplant Recipient: A Case Report

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Background: Tuberculosis (TB) is a serious complication in renal transplant recipients, especially in developing countries. TB lymphadenitis is among the most common extra-pulmonary presentations. The TB incidence in kidney recipient patients is greater than the general population.

Case Report: A 22-year-old man presented with a 2-month history of a cervical and periauricular non-tender swelling after kidney transplantation. After a few days, a post-auricular fistula developed. The patient had no other systemic symptoms such as fever or night sweats. There was no evidence of pulmonary involvement in chest radiography; the Mantoux test was negative. He underwent excisional biopsy of the cervical tissue; the diagnosis was made on the basis of histopathology and growth in culture of Ziehl-Neelsen. For treatment we begin two months of rifampicin, ethambutol, isoniazid, and pyrazinamide followed by 9 months of isoniazid and rifampicin. Clinical response, termination of discharge, and then shrinkage of the lesion, followed the treatment promptly.

Conclusion: Post-transplant TB is a major problem in kidney transplant recipients and is a life-threatening infection. In transplant patients, atypical presentation may delay diagnosis.

Keywords: Tuberculosis; Renal transplantation; Lymphadenitis

Management of Coagulopathy in Heart Transplant Surgery

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Background: Although, coagulopathy and massive bleeding are common after all types of cardiac surgery, heart transplant recipients have additional risk factors because of peri-operative coagulopathy and hemostatic abnormalities in platelet function and coagulation factors. Although surgical bleeding can happen in

heart transplant surgery, nonsurgical bleeding is more common.

Objective: To review the related literature indexed in ISI, PubMed, Medline and Scopus databases in recent 5 years.

Diagnosis: Pre-operative evaluation for coagulopathies in heart transplant recipients includes renal and hepatic function tests and also checking history of anticoagulants consumption. ACT is used for intra-operative assessment during CPB. Thromboelastography is more sensitive and specific test for measuring quality of clot formation during coagulation process that help for perfect diagnosis of intraoperative bleeding and reduction of blood products transfusion. For evaluation of platelet function, although platelet aggregometry can be used but simple way for this purpose is platelet function analyzer 100 (PF-100). Fibrinogen and D dimer can be measured directly for testing of fibrinolysis

Hemostatic Drugs: Reversal of coagulopathy includes oral and iv vit K, FFP, prothrombin complex concentrate (PCC) and recombinant factor VIIa (rFVIIa). Pharmacological management for non-surgical bleeding after heart transplant surgery is a topic for many research studies. Aprotinin is the inhibitor of many protease enzymes; in the coagulation process, it is used for reversal of coagulopathy, however due to increased risk of renal failure, myocardial infarction, encephalopathy, and stroke use of aprotinin in recipient is a big concern and in many centers it has not been used routinely. Tranexamic acid and epsilon aminocaproic acid are antifibrinolytic agents but without serious side effects. Desmopressin can also be used; it stimulates release of factor VIII. FFP and other blood products administration should be used guided by coagulation tests. We should give enough blood products to achieve PT and aPTT at least 1.5 times the control mean. Fibrinogen infusion is indicated until a concentration of 1 g/L is reached.

Conclusion: Coagulopathy after heart transplant surgery needs rapid diagnosis. Then it should be reversed using a multifaceted treatment strategy.

KEYWORDS: Heart transplant; Cardiac surgery; Coagulopathy

Long-term Outcome after Sternochondral Allograft for Anterior Chest Wall Reconstruction

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Background: Sternum needs reconstruction after wide resection of tumor and occasionally bone defects caused in sternal wound infection after cardiac surgery. A search for the ideal material for chest wall reconstruction continues to challenge thoracic surgeons.

Objective: Herein, we present the long-term outcome of bone allograft for sternal reconstruction.

Methods: Between January 2012 and August 2015, four patients with sternal bone tumors (including synovial cell sarcoma, myxoid tumor, fibrous tumor, and chondroma), and two patients with wound infection after cardiac surgery, were treated; the defects were reconstructed with bone allograft. After thorough evaluation and taking consent for bone allograft, they were put on the list from a heart beating donor. All operations were done within 1 month with consideration of body size match. Sternum was used after processing by serial culture, freezing and sterilized with ethylene oxide. Allograft was fixed with titanium microfixation and locking screw, after tailoring to fit perfectly the chest wall defect. Bilateral pectoralis major muscles flaps were used to cover the grafts.

Results: The operations were uneventful. The first patient with a BMI of 40 kg/m² developed infection in soft tissue and breast. Her wound was managed with water jet hydrotherapy and negative pressure wound therapy; the allograft was left in place. CT scans taken 6 months to 2 years after the operation from 4 patients were normal with some areas of vacuolization and decreased mineralization. The last patient had prolong

seroma formation. Within 9 months, she had two operations; one for refixation of the allograft to both clavicular ends. The second operation was for persistent seroma with partial low allograft stability. Two obese patients with allograft post-CABG were died 35 to 45 days post-op due to cardiac events unrelated to bone allograft and wound healing.

Conclusion: This technique is new in chest wall reconstruction. It provides good functional and cosmetic results. Bone allograft is more resistant to infection without immunogenic reaction. Allograft procurement, body size match, and limitation in donation are major issues. Further studies are needed to better understand the biology of such volume bone allograft and long-term results.

KEYWORDS: Sternum; Tumor; Infection; Bone allograft; Reconstruction

Lung Transplantation Challenges in Iran

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Background: Lung transplantation is the treatment of choice for end-stage lung disease for more than 2 decades. In 2012 more than 225 centers registered lung transplantation. How about Iran? Why are we still disappointed?

Methods: As a general thoracic surgeon who has been interested in lung transplantation since 1992, when I started fellowship, I tried to explain major challenging issues and little progress in lung transplant program in Iran. Nowadays, with more than two decades of kidney transplantation program and one decade of liver transplant program we have 3000 kidney and 500 liver transplantations per year. Pancreas and multivisceral transplant is in progress. Thoracic transplant has been done for more than a decade with more than 600 heart transplants and less than 90 lung transplants. I involved in kidney and liver transplant for 6 years and participated as a member of team involved in the first bilateral lobar lung transplant, heart and lung transplant and conducted the first bilateral lung transplant in Shiraz University. I moved to Tehran where I have been participated as a senior surgeon in 18 lung transplantations, but I still am disappointed for slow progress and lack of a well organized program. I spent for more than 1 year in Herefield Hospital and witnessed lung transplantation in USA (UCLA), Canada (Toronto), Austria (Vienna) and attended four International Society of Heart and Lung Transplantation (ISHLT) meetings. I believe the big issue we are facing is lack of an active and continuing lung transplant program. We know that the first lung transplant recipient is still alive and is on waiting list for the second lung transplantation. Since the beginning of lung transplantation we had more than 60 transplants in one center and more than 20 in other centers with at least 3 centers did 1 to 2 lung transplantations. Are there problems in technique, instrument, team work, or training? There are a lot of problems.

Results: The lung transplantation program is well established in world. In 2014, ISHLT reported a total of 49,642 lungs registered; between July 2012 and June 2013, the annual value was 3555. The protocol, team members, techniques, instruments, training and education have been developed and many collaborative studies have been conducted and reported. We started lung transplant as compare to kidney and liver transplants with less training and under a substandard circumstance. There are local and government issues such as organizational infra-structures, instruments, training of all team members, encourage team work, lack of correct leadership and socioeconomic support of the team and lung transplant candidates.

Conclusion: Lung transplantation is a scientific and academic fellowship. Not everybody who has finished their training in thoracic surgery, pulmonology, or anesthesiology could succeed in lung transplantation, without a solid knowledge of and training in the field. It is much far from reading a chapter in a classic textbook. Each country needs a native program. However, it is necessary to acknowledge that lung transplantation is a science and needs team work and education not solely for a surgeon but for all team members. Thoracic surgery ward needs to be standardized. Lung transplant can help many patients. The international

outcome is good. We need to closely collaborate with international societies and academic centers to learn their experience. It is our fault to have little progress in lung transplantation and not the complexity of lung transplantation.

KEYWORDS: Lung transplantation; Team work

Renal Transplantation and Urolithiasis

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After Imam Khomeini's *fatwa* and the establishment of Organ Procurement Organization/Center in the Ministry of Health and Medical Education, kidney transplantation has been increased in all kidney transplant centers throughout Iran, including in Mashhad, northeastern Iran. Renal stone is a contraindication for transplantation (one exception). Urolithiasis in renal transplant recipients, though rare, nonetheless needs a thorough approach, knowledge, evaluation, and treatment. Ureteral stone in kidney transplant recipients needs urgent admission and treatment. Treatment of urolithiasis in kidney transplantation is multidisciplinary. Herein, we are going to discuss our experience in treating these patients.

KEYWORDS: Kidney transplantation; Nephrolithiasis

Human Head Transplant

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This technology is similar to the first man to walk in space. This is because in the future it will help thousands of people who are in an even more deplorable state than I am. We hope this technology will lead to success.

As mind-boggling as the idea of a head transplant may be today, not that long ago the same could have been said about a heart transplant or even a liver transplant.

The head from a donor body will be removed using an "ultra-sharp blade" in order to limit the amount of damage the spinal cord sustains. "The key to SCF is a sharp severance of the cords themselves," Dr. Canavero explains in a paper published earlier this year, "with its attendant minimal damage to both the axons in the white matter and the neurons in the gray laminae. This is a key point." The surgeon estimates that—with the help of physical therapy—the patient would be able to walk within 1 year.

KEYWORDS: Transplantation, brain; Neurosurgery

Extracorporeal Membrane Oxygenation (ECMO) in Heart or Lung Transplantation

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Heart or lung transplants often used in patients with end-stage heart or lung disease. Organ transplantation has improved because of surgical technique and post-operative care, improvement in the treatment, prevention of opportunistic infections and suitable donor organs. The median survival rate for heart and lung transplantations, respectively, are 11 and 5.7 years. The major causes of early death (the first year) after transplantation include primary graft failure, infection, and rejection. Extracorporeal membrane oxygenation (ECMO) has been demonstrated to be beneficial in treating primary heart and lung graft dysfunction.

ECMO is a technique increasingly used to provide support for the failing lung, heart or both. There are two models of ECMO. VV (venovenous)-ECMO is commonly used in respiratory failure, but VA (venoarterial)-ECMO used in heart failure. Earlier studies evaluated the outcomes of ECMO in patients with lung and heart transplantation. The first ECMO was associated with poor survival, but in the past 30 years, recent technological developments such as new oxygenator materials and centrifugal pumps have led to a decrease in inflammatory response and hemolysis; in the meantime ECMO allows more prolonged support time without the physiological derangements. Several studies indicated better outcomes in patients using ECMO heart or lung transplant recipients with critical conditions. ECMO may be useful as a recovery strategy in HTx patients with graft-failure or respiratory failure while patients are waiting for the organ and after transplantation.

Utilization of ECMO in the USA is increasing quickly and created an evolutionary change in saving lives. In Iran, ECMO is a new technique and its usage has many limitations such as lack of teamwork skills and special equipment, its price and consumer goods. Therefore having the ability to use the ECMO for heart-lung transplant centers seems to be necessary.

KEYWORDS: ECMO; Heart transplant; Lung transplants

Transplantation in Spinal Cord Injury

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Spinal cord injury affects both neurons and the myelin sheath that insulates axons. Spinal cord injuries (SCI) are devastating and debilitating conditions affecting people all over the world, particularly young adults. They are associated with severe physical, psychological, social and economic burdens on patients and their families. To develop effective treatments for SCIs, a precise understanding of the main events following the injury and how these events interact is needed. The injuries include shearing, laceration, and acute stretching. Acceleration-deceleration events

can also cause spinal cord injury, but very rarely lead to complete disruption of the spinal cord. At a cellular level, axons are crushed and torn, and oligodendrocytes, the nerve cells that make up the insulating myelin sheath around axons, begin to die. Exposed axons degenerate, the connection between neurons is disrupted and the flow of information between the brain and the spinal cord is blocked. The body cannot replace cells lost when the spinal cord is injured, and its function becomes impaired permanently. Patients may end up with severe movement and sensation disabilities. Depending on the location and the extent of the injury, patients may suffer complete or incomplete paralysis, and loss of feeling, sexual function, and bowel control. The presence of spared axons crossing the injury site holds great therapeutic potential, and is the basis of a number of emerging therapeutic strategies. A combination of therapies is needed, acting at the appropriate time-point and on the correct targets.

Stem cell treatments have begun to be tested in clinical trials by using neural stem cells, mesenchymal stem cells, and embryonic stem cells. Animal studies have shown that a transplantation of stem cells or stem-cell-derived cells may contribute to spinal cord repair by: (a) replacing the nerve cells that have died as a result of the injury; (b) generating new supporting cells that will reform the insulating nerve sheath (myelin) and act as a bridge across the injury to stimulate regrowth of damaged axons; and (c) protecting the cells at the injury site from further damage by releasing protective substances such as growth factors, and soaking up toxins such as free radicals, when introduced into the spinal cord shortly after injury—preventing spread of the injury by suppressing the damaging inflammation that can occur after injury.

KEYWORDS: Transplantation, spinal cord; Neurosurgery

Comparison of On-arrival Parameters of Organ Donors between Mashhad Resident Brain-Dead Cases and those Referred from Outside the City

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Background: Organ transplantation from brain-dead patients can save lives and is an important field in medicine. The donor and recipient of the organ are not always residents of the same city. Transfer of the brain-dead patient to the transplant center or transfer of the organ after removing it from the donor, is a matter of debate. Transfer of the patient theoretically increases the risk of death and may cause vital sign instability and organ damage. Transfer of the organ alone also increases organ ischemic time.

Objective: In this study we compared the vital signs and paraclinic indices of brain-dead patients who were transferred for harvesting and donors who were harvested in the primary center.

Methods: In a retrospective cohort study, the data of 128 brain-dead patients who were referred to Montaserieh Transplantation Center during 2 years were collected. On-arrival parameters including vital signs and paraclinic exams were compared between patients hospitalized in Mashhad and patients transferred from outside the city.

Results: No statistically significant difference was observed between the two groups in terms of pulse rate,

temperature, blood pressure, diuresis, hematocrit, hemoglobin, blood oxygen saturation, sodium, potassium, bilirubin, urine, and blood culture.

Conclusion: We concluded that transferring brain-dead patients candidate for organ donation under standard conditions is safe; it does not negatively affect vital signs and paraclinic indices; there is no difference between candidates hospitalized in the city where the surgery is to be taken place and candidates transferred from outside the city.

KEYWORDS: Organ transplantation; Resident donor; Transfer of patient; Brain death

Development of a Liver Transplant Registry System Based on Minimum Data Set

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Background: Liver transplantation (LT), as the premier treatment for end-stage liver disease, has led to a phenomenal outcome improvement among predisposed population. Providing an analytical platform is essential for short- and long-term monitoring of its repercussion in outcomes.

Objective: To describe design and rationale for the implemented an LT Registry.

Methods: Liver transplant professionals from Namazi and Montaserieh Transplant Centers were asked to score 124 items provided by reviewing literature and paper-based medical records. A data item was included into registry's database if 4 out of 7 or more raters scored the item 4 or 5 on a 5-point Likert scale. To demonstrate experts' opinion consistency Cronbach's α was calculated for each data category. As raw data were being entered, range and consistency validation checks guaranteed data accuracy and consistency in the database. Moreover, a GUI with patient history visualization, screening tests' reminders and automatic survival calculation utilities has been chained to the database for more effective data representation.

Results: Seven participants (5 transplant surgeons, 1 internist, and 1 coordinator GP) made consensus on 87 items (10 clinical history, $\alpha=0.92$; 27 laboratory, $\alpha=0.86$; 3 death, $\alpha=0.85$; 6 socio-demographic, $\alpha=.77$; 5 donor, $\alpha=0.76$; 10 (peri-)operative, $\alpha=0.75$; 13 supplementary consultation, $\alpha=0.74$; and 13 complications, $\alpha=0.71$).

Conclusion: The implementation of the computerized LT registry was just the initial and essential step of an endeavor to continue improvements in the quality of care within our service. However, further assessments are required to assure long-term quality of the obtained data and its decision support effectiveness.

KEYWORDS: Liver transplant; Registry; Expert consensus

Oral Manifestations, Dental Management and Challenges after Bone Marrow Graft

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Background: Dentists have some challenges in the treatment of patients after bone marrow graft. Sometimes, they need some emergency dental treatments or are consulted for oral complications post-graft.

Objective/Methods: In this paper, we discuss about oral manifestations and dental management after bone marrow graft.

Results: Because of leucopenia or thrombocytopenia due to immunosuppressive drugs in these patients, they are exposed to infection or bleeding during dental treatments.

Conclusion: If the count of platelets is below 50,000/ μL , elective dental treatments should be postponed and platelet transfusion is necessary for emergency procedures. If the white blood cell count falls below 2000/ μL and neutrophil count is below 1000/ μL , therapy needs multi-doses of prophylactic antibiotics. Furthermore, some oral presentations in these patients should be diagnosed properly. For example, acute necrotizing ulcerative gingivitis on palatal or gingival mucosa presents as punched out ulcer; patients with this ulcer complain of tooth pain. Other oral manifestations include oral ulcers, candidiasis, and spontaneous gingival bleeding. Immunosuppressive drugs lead to oral mucositis and consequently malnutrition. Treatment of oral lesions consists of palliative therapy, anti-fungal, local or systemic anti-inflammatory drugs. Early diagnosis of oral lesions and appropriate treatments decrease patients' suffer and improve their nutrition and prevent complications of malnutrition.

KEYWORDS: Oral manifestation; Dental management; Bone marrow graft

Reevaluation of Necessity for Second Examination to Confirm Brain Death in Mashhad's Cadaver Donation Policy 2002-2012

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Background: Brain-dead patients, those with irreversible total dysfunction of all cortical, subcortical and brain stem simultaneously, are one of the most important sources of supplying organ donations nowadays. Iran's policy of organ donations declare a 24-hour gap to reevaluate a brain-dead patient for confirming with clinical findings and test. It varies with other countries' policy such as US or Australia—with a 6-hour gap—or other parts of the world. These situations caused a burden of costs as well as difficulties for health care system in Iran and a higher risk of wasting of probable organs for donation.

Methods: In a retrospective study, we examined medical charts of those brain-dead patients diagnosed in hospitals affiliated to Mashhad University of Medical sciences who did not resulted in organ donations with various reasons from 2002-2012.

Results: There was no significant relation between sex, age or cause of death and the interval of confirming brain death. There was not even a single case of denying brain death primary confirmation. Of 516 cases with known and confirmed brain death, 91 led to failure of organ donation due to reevaluation time. Among our selected 91 cases of organ donation failure 61(67%) expired because of cardiopulmonary complications, 12 (13%) wasted in relation to renal dysfunction, and other 18 (20%) cases for moral or underlying problems.

Conclusion: Regarding the presenting study, there is not only no reason for a 24-hour interval between primary and secondary confirmation of brain death in probable cases of organ donations, but it would be a wise decision if the time gap could be omitted due to higher chance of not wasting organs during primary and secondary confirmation.

KEYWORDS: Brain death; Survival; Organ transplantation

Transplantation of Bone Marrow Stem Cells in Patients With Limb Ischemia and Diabetic Foot Ulcer

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Background/Objective: The aim was to investigate the therapeutic effect of bone marrow stem cells transplantation on patients with lower limb ischemia and diabetic foot ulcer, which are not responsive to common treatments.

Methods: We report on three separate clinical trials as follow: in the first trial, 15 patients with severe chronic limb ischemia, in the second trial, 8 patients with aggressive refractory diabetic wounds, and in the third trial, 15 patients with diabetic foot ulcer unresponsive to 4 weeks standard treatment were studied. Autologous bone marrows were aspirated from the iliac crest under general anesthesia. Mononuclear cells were isolated under proper manufacturing practice conditions by Ficoll-Hypaque density separation. The cells were injected intramuscularly into the calf and interosseous foot muscles of the ischemic leg and were implanted in the diabetic wound by 1.5-cm deep injections into various sites and the margin of the wound.

Results: All clinical parameters, including ankle brachial index, pain as measured by a visual analog scale, and pain-free walking distance, showed a mean improvement from baseline, which was measured at 4 and 24 weeks after transplantation in patients with limb ischemia. In the second study, 4 weeks after the treatment, the wound was completely closed in three patients and significantly reduced in remaining patients. In the third study wound surface was reduced by 66% during two weeks.

Conclusion: Autologous transplantation of bone marrow mononuclear stem cells into ischemic lower limbs is considered to be safe, feasible and efficient for patients with severe peripheral artery disease. Also, this method is effective in patients with chronic and refractory diabetic foot ulcer.

KEYWORDS: Bone marrow; Stem cell; Lower limb ischemia; Diabetic foot

Left-Sided Inferior Vena Cava Encountered During Organ Retrieval Surgery: Report of Two Cases

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Left-sided inferior vena cava (IVC) is the second most common anatomical anomaly of IVC after duplication. Herein, we present on two cases of left-sided IVC, diagnosed during organ retrieval procedure. In a young brain-dead man, a single left-sided IVC was observed, beginning from the iliac confluence. It was in the left side of the aorta throughout the abdominal pathway. There was

no retrohepatic IVC in the case and hepatic veins drained directly into the right atrium. The second case was a brain-dead young woman with a left-sided IVC from iliac confluence to the kidney level. Then the IVC was crossing anterior to the abdominal aorta to join a normally positioned retrohepatic IVC. In cases of retroperitoneal surgeries, IVC anomalies should be considered during pre-operative imaging studies, because they may be misdiagnosed as para-aortic lymphadenopathy, tumor or dilated gonadal vein that result in iatrogenic damage during surgery.

KEYWORDS: Vena cava; Inferior; Anatomic variation; Tissue and organ Harvesting; Transplantation; Liver

Seroprevalence of Parvovirus B19 among Kidney Transplant Recipients: A Single-Center Study

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Background: Parvovirus B19 is a DNA virus, which is responsible for several various diseases in human. Parvovirus B19-induced persistent anemia is one of its manifestations, which is relatively common in transplant recipients.

Objective: To investigate the seroprevalence of parvovirus B19 among kidney transplant recipients.

Methods: 91 transplant recipients were selected at random and investigated for several variables including age, sex, educational status and history of hemodialysis (HD), blood transfusion, and immunosuppressive therapy. Blood samples were collected via venipuncture and evaluated for anti-parvovirus B19 IgG antibody using enzyme linked immunosorbent assay (ELISA).

Results: All recipients had anemia; 72.5% of them had severe anemia ($Hb \leq 11$ in men and ≤ 10 g/dL in women). 63 patients (69%) were seropositive for parvovirus B19. There was no significant difference in age, sex, educational status, and history of blood transfusion, HD, and the immunosuppressive therapy between seropositive and seronegative groups.

Conclusion: The seroprevalence of parvovirus B19 was relatively high among kidney transplant recipients. Anemia is a common problem in these patients and often remains under-treated. However, our study failed to find a correlation between the severity of anemia and seropositivity of parvovirus B19.

KEYWORDS: Parvovirus B19; ELISA; Renal transplantation; Anemia

The Test of Choice to Assess the Function of an Auto-Transplanted Spleen

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Background: Historically, total splenectomy was the only choice for traumatic splenic injuries. However, nowadays, non-operative management and spleen preservation surgical techniques have been preferred. In some situations that the surgeon is urged to do splenectomy, spleen autotransplant may save the splenic function. Selecting the best way evaluating the spleen slice autotransplant's function has been a matter of

debate for many years.

Objective: To compare the three common tests to assess the function of an auto-transplanted spleen.

Methods: Participants included 10 candidates for laparotomy and splenectomy. After doing splenectomy, we implanted 5 pieces of spleen in the great omentum in every patient. After three months, the implanted spleens' function was evaluated by nuclear RBC scan, serum immunoglobulin level, and presence of Howell-Jolly (HJ) bodies in peripheral blood smear.

Results: All studied patients had normal peripheral blood smear. Only in one of them, the IgM level was lower than normal and only in one case, scintigraphy did not show the transplanted spleen.

Conclusion: All these tests may have comparable results, but because the peripheral blood smear is much easier to perform, more accessible, and cheaper, it should be considered the first test to evaluate the implanted spleens' function.

KEYWORDS: Autotransplantation; Spleen; Immunoglobulin

Malignancy after Heart Transplantation

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Background: Heart transplantation remains the gold standard of treatment for patients with end-stage heart failure. With the evolution of potent immunosuppressive drugs, the survival rates of the patient and graft have improved significantly. According to the registry of the International Society for Heart and Lung Transplantation (ISHLT) in 2008, the cumulative prevalence of malignancy in heart transplantation recipients at one year was 2.9%; at 10 years it was 31.9%. The most commonly reported tumors are skin cancer and post-transplant lymphoproliferative disorders.

Objective: To present a case of cutaneous T-cell lymphoma after heart transplantation.

Case: In January 2011, an 18-year-old man with a history of progressive dilated cardiomyopathy underwent orthotopic cardiac transplantation. Standard triple-agent immunosuppressive therapy (cyclosporine, prednisolone, and azathioprine) was begun after surgery. In May 2012, the patient developed a left inguinal nodule about 3 cm in diameter. Wide excision was done. Immunohistochemistry showed PT-CTCL. Viral studies in our patient were negative. His CT scans continued to be negative for systemic involvement. He was referred to oncologist.

Discussion: The incidence of lymphoproliferative disorders in solid organ transplant recipients is 25 to 50 times greater than that in the general population. Most cases are of B-cell phenotype and associated with Epstein-Barr virus infection. Reduction of immunosurveillance, chronic antigenic stimulation by the transplanted organ and direct oncogenetic potential of immunosuppressive drugs could be considered risk factors for PTLSD in transplant recipient. Transplantation surgeon should be aware of the possibility of PT-CTCL in cardiac transplant patients.

Conclusion: The long-term outcome of heart transplantation is strongly affected by the occurrence of malignancy in immunosuppressed transplant recipients. Since post-transplantation malignancy is commonly seen after heart transplantation, routine screening for malignancy is mandatory

KEYWORDS: Heart transplantation; Malignancy; Neoplasm

Assessment of Organ Donation Barriers among Volunteer Blood Donors in Mashhad: 2013-2014

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Background: Organ donation from brain-dead patients is a legal accepted issue in medical sciences. However, generally, people are not aware of it and they are unwilling to donate their brain-dead relatives' organs. It is said that people's unawareness from requires to transplant organs, is an important factor that affects volunteers' decision. Recognition of individuals' motivations and tendencies to donate organs from brain-dead or alive individual, and barriers that prevent donation, improve organ donation procedure.

Objective: To assess obstacles of organ donation in blood donor volunteers.

Method: This cross-sectional study was conducted during 2013-2014, among blood donors who referred to blood donation centers in Mashhad, northeastern Iran. Questions were asked from 640 volunteers of blood donation in the form of written questionnaire.

Results: 43.1% of the 640 participant blood donors did not agree with organ donation without giving any reasons. Only 2.22% believed that corpse had to be buried.

Discussion: According to the selected options by volunteers, it seems that public training in and awareness about organ donation and the need of transplantation are necessary.

KEYWORDS: Organ donation; Brain death; Knowledge; Attitude

The Effect of 3D Culture Systems on the Chondrogenic Differentiation of Chondrocytes

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Background: The advent of cell-based therapies as a novel therapeutic platform has the potential to revolutionize the future of health care, driving a shift from the management of disease symptoms to their cure. Chondrocytes are the main cell type found within cartilage that used for tissue engineering strategies.

Objective: In present study, we compared the gene expression of chondrocyte on the fibrin glue (Fg) biomaterial and pellet system culture during chondrogenic differentiation.

Methods: In this study, articular chondrocytes were obtained under sterile conditions from femoral head caps of male patients during total knee alloarthroplastic procedure (n=3). Also, Fg biomaterial was prepared. Then, chondrocytes were seeded on Fg biomaterial; these cells were also cultured as pellet system culture under chondrogenic conditions. Two weeks after chondrogenic induction, cells were checked by real-time PCR.

Results: Isolated cells had cartilage-like morphology under invert microscope. Real-time PCR of the chondrocytes on two 3D culture systems showed differences in expression of chondrogenic-specific genes (collagen II, aggrecan and sox9) between chondrocytes seeded on Fg biomaterial and pellet system culture.

Conclusion: We demonstrated that chondrocytes can be isolated from femoral head caps. Chondrocytes seeded on Fg biomaterial showed greater chondrogenic potential. Fg biomaterial applied in this study seems suitable for the chondrogenic differentiation of chondrocytes.

KEYWORDS: Articular chondrocytes; Fibrin glue biomaterial; Real-time PCR; Chondrogenic-specific genes

Effect of Autologous Bone Marrow Stem Cell on Panel

Reactive Antibodies in Patients with Chronic and Progressive Renal Failure: a Pilot Clinical Trial

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Background: *In vitro* and *in vivo* immunosuppressive properties have been described for mesenchymal stem cells (MSCs), as they are able to modulate the function of all major immune cell populations. They represent important candidates for tissue regeneration and manipulation of the immune response in graft rejection, graft vs. host disease, and autoimmune disorders.

Objective: To evaluate effect of autologous bone marrow stem cell on panel reactive antibodies in patients with chronic and progressive renal failure.

Methods: This is a pilot study on 17 patients with CFR (9 in the intervention group and 8 in the control group). Panel reactive anti-bodies before and after injections of stem cells from bone marrow that containing acceptable percent of MSCs in the intervention group compared with the control group. 200–400 mL bone marrow was aspirated; then nucleated cells were separated from red blood cells; those cells were then injected to patients via a peripheral vein.

Results: The mean±SD age of participants was 41.8±12.37 years in the intervention group and 40.4±12.7 years in the control group (p=0.807). The mean±SD panel antibody reaction was 69.9±6.2 in the intervention group and 70.3±13.5 in the control group (p=0.956). There was a significant (p=0.043) difference between panel antibody reaction before and after the intervention (51.6±26.4).

Conclusion: Infusion of allograft MSCs, might be an effective therapy for patients with high panel reactive antibodies.

KEYWORDS: Mesenchymal stem cells; Panel reactive antibodies; Immunosuppressive effect

Nursing Diagnosis: an Important Care in Liver Transplantation

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Background: Liver transplantation is currently considered the most complex therapeutic procedure because the liver, one of the largest organs of the body, is responsible for several functions that affect different systems of the body. For this reason, nursing diagnosis and care plan after surgery are so important.

Objective: To discuss how importance the nursing diagnosis is in care of patients undergoing liver transplantation.

Methods: In this article, we reviewed English and Persian articles published in various information sources between 2004 and 2015 about nursing diagnosis in liver transplantation.

Results: The era of liver transplantation in human beings is recent. It started approximately 40 years ago with the pioneering work of Starzl who performed the first human liver transplantation in 1963. The post-operative period is the most critical time of the entire transplant process. Short- and long-term complications following liver transplantation are liver artery thrombosis, anastomosis complications, fever, rejection, and side effects of immunosuppressive drugs. For this reason before and after liver transplantation, caring and teaching patients is of utmost importance. The most important nursing diagnosis are impaired

tissue integrity, impaired bed mobility, risk for aspiration, risk for infection, risk for impaired skin integrity, risk for falls, ineffective protection, risk for constipation, imbalanced nutrition, and excess of fluid volume.

Conclusion: Time after liver transplantation is the most part of surgery. The role of nurses in caring post-operative patients is very important. They could help patients' recovery after liver transplantation. These cares begins from admission and ends after discharge.

KEYWORDS: Liver transplantation; Nursing diagnosis; Nursing care

Knowledge and Attitudes of Emergency and Intensive Care Nurses About Brain Death and Organ Donation in 2015

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Background: Brain-dead patients are not salvageable. While the number of patients in need of organ transplantation is increasing, the shortage of organ donors remains significant.

Objective: To determine the knowledge and attitudes of Bojnurd citizens towards brain-dead and organ donation.

Methods: In this cross-sectional study, conducted in August 2015, 122 emergency and intensive care nurses of Bojnurd's hospitals were selected through a convenient sampling method. The tool used, was a self-completing questionnaire consisting of three parts; it was validated by content validity method; its reliability was determined by Chronbach's α .

Results: 65 of studied nurses were female. The mean \pm SD age of participants was 31.1 \pm 6.5 years. The mean \pm SD knowledge and attitude scores were 14.4 \pm 2.4 and 52.1 \pm 6.1, respectively. There were not significant differences between males and females in terms of knowledge and attitude scores.

Conclusion: The knowledge of nurses was good and the attitude was in moderate level. With regard to the important role of nurses in caring of patients' family member, it has been suggested that some necessities should be provided for transferring this knowledge to brain death patients' families.

KEYWORDS: Organ transplantation; Brain death; Knowledge; Attitude; Nurse

New Surgical Techniques in Heart Transplantation: Five Years of Experience

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Background: Heart transplantation is the final treatment for end-stage heart failure. Heart failure has been increased recently due to cardiomyopathy and ischemic heart disease. Results of heart transplantation are much better today because of introduction of the novel immunosuppression regimens and also better surgical techniques, especially in decreasing time of cardiac ischemic time and excellent protection strategy.

Methods: The preferred technique in our center for heart transplantation is bicaval technique. Advantages for bicaval technique in comparison to biatrial include shorter hospital stay, lower atrial dysrhythmias, lower mitral and tricuspid valve incompetency, and lower right ventricle failure. We perform anastomosis in the following orders: at first, the left atrium and then the pulmonary artery and aorta, IVC, and finally the SVC. There is an option that after completing the anastomosis of the left atrium and aorta, aortic cross clamp should be removed for faster reperfusion of the allograft. Before releasing of the aortic clamp, the anesthesiologist gives a bolus of 500 mg intravenous methylprednisolone. At the end of the procedure and before trying for weaning cardiopulmonary bypass, the aortic root vent is inserted for effective de-airing. We give about 15 min for reperfusion of the allograft before the weaning process. With use of intra-operative transesophageal echocardiography, we evaluate the function of RV, LV, and all cardiac valves.

Conclusion: By improving surgical techniques and post-operative care of heart transplant recipients, we expect that results and survival of heart transplant surgery will be better in future.

Keywords: Heart transplant; Cardiac surgery; Bicaval technique

Comparison of the Sound Level in Renal Transplantation Wards with Intensive Care and Emergency Wards

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Background: Development of technology has increased the sound level beyond standards in hospitals. Such pollution has significant negative effects on the health of hospital staff and quality of care accordingly.

Objective: To investigate noise levels in nephrology and renal transplantation wards and comparing them with intensive care units as the quietest places and emergency wards as the noisiest places in a hospital.

Methods: This study was performed by measuring sound levels in 10 wards (nephrology, all intensive care units, renal transplantation, and emergency wards) of Imam Reza Hospital in a 30-min interval of AM working shift by an EXTECH (M-407727) device located one meter away from nursing stations getting maximum sound level (Lmax) and Average Sound Level (Leq).

Results: Lmax in most wards were between 85 and 86 dB. Leq in all wards was approximately 60.2 dB. The average Leq in emergency wards was 62.2 dB without any justification. The highest Leq was observed in nephrology ward (63.7 dB). Leq in renal transplantation ward was 56.6 dB. In most wards, the peak of noise was between 9:30 and 11:00 AM. In all studied wards, Leq exceeded the standard levels.

Conclusion: The average sound levels in our wards were remarkably higher than the standards levels. Leq in nephrology ward was more than the emergency wards.

KEYWORDS: Sound levels; Renal transplantation wards; Intensive care units; Emergency wards

Chest Wall Reconstruction after Breast Cancer Recurrence

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Background: Advanced breast cancer or recurrence, or other complications after its treatment are challenging issues because of chest wall defect after resection. Use of autologous tissue like flap and graft can be lifesaving and a good choice for treatment.

Methods: We reviewed our patients with chest wall defects due to advanced breast cancer, recurrence of the tumor, or other complications like post-radiation wound and sarcoma that were reconstructed with autologous tissue in Ghaem Hospital, Department of Thoracic and General Surgery, Mashhad University of Medical Sciences, Mashhad, Iran from 2004–2015. We analyzed their data like age, pathology, kind of reconstruction and complications.

Results: 19 patients underwent reconstructive breast disease operations. The mean±SD age of patients was 49.0±15.8 (range: 16 to 70) years. Pathological reviews have shown that the most common indication for surgery was recurrent breast cancer in 7 cases (37 %). 5 patients (26%) had advanced primary breast cancer, 3 (16%) had wound after radiotherapy, 2 (11%) developed post-radiation sarcoma, 1 (5%) had chest wall defect after resection, and 1 (5%) had lymphoma. 11 patients (61%) underwent autologous transplant (muscle flap transposition). The three most common muscle groups utilized were latissimus flap (44%), TRAM (*rectus abdominis*) flap (11%) and pectoralis flap (6%). Reconstruction in 2 patients (11%) was done with prosthesis and flap; in 4 patients (22.2 %) it was done with omentum and skin graft. In 1 patient (6%) reconstruction of chest wall was made by means of mesh, cement and flap. Post-operative complications occurred in 2 patients and included skin necrosis (n=1) and death (n=1) because of myocardial infarction after operation.

Conclusion: In chest wall defects after advanced breast cancer or other complications that is due to radiation to chest wall, transplant with autologous tissue can be the first choice of treatment.

KEYWORDS: Breast cancer; Recurrence; Chest wall

Assessment of Patient's Compliance and Satisfaction with Home Spirometry and its Impact on Early Diagnosis of Pulmonary Symptoms in Post-Lung Transplantation Patients

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Background/Objective: Telemedicine is useful in monitoring patients, and in particular those who are suffering from chronic illnesses (*e.g.*, lung transplant recipients).

Methods: This cohort study was conducted on 15 lung transplant recipients. The patients provided physicians with data from spirometry as well as their clinical respiratory symptoms via SMS messages. If the spirometry results or clinical symptoms required follow-up, the monitoring physician contacted the patient according to guidelines and gave appropriate instructions.

Results: Qualitative assessment of satisfaction showed that the sense of increased support from medical staff was rated highest (93%).

Conclusion: Telespirometry is an efficient method of monitoring lung transplant recipients and leads to patient's satisfaction, compliance, adherence to study protocol and sense of security. Nevertheless, for optimal implementation of this method, thorough training of both medical staff and patients is required.

KEYWORDS: Telemedicine; Lung transplantation; Home spirometry; Telespirometry; Patient adherence

14-Year Experience of Orthotopic Liver Transplantation

from Under 10 y/o Deceased Children Donors in Nemazee Hospital, Shiraz, Iran

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Background: End-stage liver disease in children needs liver transplantation. Deceased children donors are one of the sources that could be used for reduction of morbidity of living donation.

Objective: To present our 14-year experience of liver transplantation from under 10 y/o deceased donors.

Methods: From December 2001 to February 2015, 156 patients underwent orthotopic liver transplantation in our center that received liver from an under 10 y/o deceased donor. Their data including demographics, indication for transplantation, and post-operative complications were collected.

Results: Patients (78 male and 78 female) aged between 10 months and 38 years received liver from children (96 males and 60 females) aged between 11 months and 9 years. Cause of brain death was 61 car/motor accident, 13 convulsion, 14 falling down, 9 ICH, 9 brain tumor, 11 other CNS problems, 9 poisoning, 27 miscellaneous, and 6 unknown cause.

Conclusion: Liver transplantation from under 10 y/o deceased children donors had an excellent success rate and deceased children donation in Iran had a good promotion since 2001. Cultural domination practices in this field shorten liver transplantation waiting list in children.

KEYWORDS: Liver transplantation; Deceased children donor; Iran

Evaluation of the Effect of Ascorbic Acid Administration on Gene Expression Level of IL-6 and TNF- α Cytokines in Deceased Donors

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Background: Brain death is associated with increased inflammatory cytokine levels and poor graft qualities to transplant.

Objective: To evaluate the impact of ascorbic acid (AA) on the inflammatory status of brain-dead donors (BDDs).

Methods: 40 BDDs were randomly divided into two groups. Donor treatment (n=20) received 100 mg/kg AA infusion 6 hours before donor operation and subsequent infusion of 100 mg/kg q6h until organ removal. Blood samples were taken at three times—6 hours before donor surgery (TP1), immediately after laparotomy (TP2), and before organ removal (TP3). Gene expression level and serum concentration of IL-6 and TNF- α cytokines were assessed by real-time PCR and ELISA methods. To investigate transplanted liver function, serum values of aspartate aminotransferase (AST), alanine aminotransferase (ALT), and total bilirubin were measured on the 1st, 3rd, and 10th post-operative days.

Results: We found a significant reduction in IL-6 mRNA expression ratio of TP3 to TP1 following AA administration among BDDs. Despite the considerable decrease in treated donors regarding IL-6 mRNA expression ratio of TP2 to TP1, TP3 to TP2, and also TNF- α variations in these periods, the results were not statistically significant. Regarding serum concentration of these cytokines, particularly IL-6, there was a decrease be-

tween TP2 and TP3 following AA administration in the treated donors. Furthermore, a significant reduction was found in serum AST and ALT levels in the recipients of the treated group on the 3rd day compared to the 1st day after transplantation.

Conclusion: It seems that AA beneficially affects the inflammatory status of BDDs, resulting in improved primary allograft function.

KEYWORDS: Transplantation; Donor; Ascorbic acid; Protective effect

Evaluation of the Effect of bFGF Growth Factor on the Ability of Adipose-Derived Stem Cell Differentiation into Bone Lineage

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Background: In recent years, the extensive research on the potential use of stem cells in the treatment of various diseases, including bone disease has been done, due to the high potential of stem cells. Fat has considered a rich source of stem cells that besides its frequency, easy access, and non-invasive sampling method, has the ability to excellent proliferate and differentiate into other cells. Furthermore, these cells are wonderful and ideal sources for reduction of the immunological incompatibility issues after transplantation. Also, various growth factors, including basic fibroblast growth factor (bFGF), play important roles in the differentiation process of stem cells.

Objective: To assess the impact of bFGF growth factor on the differentiation potential of adipose-derived stem cells (ADSCs) into bone lineage.

Methods: In this research, stem cells were isolated from the adipose tissue obtained from three patients during nephrectomy. These cells were then placed separately in bone differentiation medium with and without bFGF. The impact of bFGF on the differentiation potential of ADSCs into osteoblast was assessed in 7 and 14 days by real-time PCR.

Results: Real-time PCR analysis demonstrated that osteogenic-specific gene expression of cells cultured in the bone differentiation medium containing bFGF had a significant difference compared with cells cultured in the bone differentiation medium without bFGF.

Conclusion: Based on our findings, we believed that bFGF has major and effective roles on differentiation of ADSCs into osteogenic lineage.

KEYWORDS: bFGF; ADSCs; Osteogenic differentiation; Real-time PCR

Clinical Experience in Liver Transplant: Mashhad Transplant Center, 2015

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Background: Mashhad Organ Transplant Center, the largest transplant center in East of Iran, has expanded its program of liver transplantation during recent years.

Objective: To summarize our experience in liver transplantation over the last 2 years and evaluate its status as of 2015.

Methods: From June 2014 to October 2015, 58 patients underwent orthotopic liver transplantation in Montaserieh Organ Transplant Hospital. The data including demographics, indications for transplantation, MELD scores, post-operative complications and their management were collected.

Results: Studied patients (24 women and 34 men) aged between 10 and 64 years. Indications for liver transplantation included HBV infection (n=17), autoimmune hepatitis (n=12), HCV infection (n=9), cryptogenic cirrhosis (n=12), Wilson's disease (n=5), PSC (n=2), and PBC (n=1). MELD score of patients ranged from 16 to 40. All patients received tacrolimus, mycophenolate mofetil, and corticosteroid, post-operatively. One patient died of pulmonary infection and multiple organ failure. The other patient expired possibly due to pulmonary emboli. Another patient died of primary non-function of the transplanted liver. 55 patients are doing well and have excellent liver functions. HCV recurrence occurred in one patient who was successfully treated with antiviral drugs and Interferon. No vascular complications was seen in the patients. Biliary stricture occurred in four patients in whom dilatation and stenting was done for two cases; other two patients underwent reoperation and Roux-en-y hepaticojejunostomy.

Conclusion: We had successful results in our experience of orthotopic liver transplant. The most indications for liver transplant in our cases were hepatitis B- or hepatitis C-induced cirrhosis.

KEYWORDS: Liver transplant; Mashhad; Survival

Outcomes and Complications of Renal Transplantation in Veterans with Spinal Cord Injury

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Background: Renal transplantation (RTx) is the treatment of choice in patients with end-stage renal disease. On the other hand, patients whose renal failure is due to a primary urological cause, such as neurogenic bladder caused by spinal cord injury, are challenging patients in terms of both the time of RTx and in their follow up.

Objective: We report on our experience of treating war veterans with renal failure because of spinal cord injury using RTx.

Methods: From 250 patients in Mashhad care center of war veterans, 5 underwent RTx due to renal failure. Two of them used clean intermittent catheterization (CIC), two used condom catheters, and one used foley catheter to manage their urinary outputs. We followed the graft survival as well as complications including infectious and urological problems in these patients.

Results: The mean age of patients in the time of transplantation was 35 years. No major graft complications occurred for our patients. Minor complications including recurrent UTI, bladder stone, and epididymo-cutaneous fistula occurred in three patients. The mean time of graft survival was 10 years.

Conclusion: Although RTx in patients with spinal cord injury is accompanied by more complications and less graft survival, it may decrease their general problems and enhance their quality of life. RTx in patients with abnormal lower urinary tract requires a more careful evaluation and follow-up.

KEYWORDS: Renal transplantation; Veteran; War injury; Complications

Double J Removal with Rigid Cystoscopy using Intra-Urethral Lidocaine or Lubricant Jelly after Kidney

Transplantation is Safe and Feasible: RCT Study

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Background: Kidney transplantation (KTx) is the best treatment option for most end-stage renal disease (ESRD) patients. Double J (DJ) stents are used during KTx surgery for ureteral re-implantation by many surgeons. These stents are usually removed 4 to 6 weeks after the operation. Double J removal is done with flexible cystoscopy applying topical anesthesia, or rigid cystoscopy under general anesthesia (GA). However DJ removal in male population after KTx has some difficulties including urethral length and high position of re-implanted ureter that make the procedure more difficult and painful. On the other hand flexible cystoscopy is more expensive and is not available in many centers.

Objective: We conducted this randomized controlled clinical trial (RCT) to assess the safety and feasibility of DJ removal with rigid cystoscopy using topical anesthesia in male patients after KTx.

Methods: This RCT was performed from March 2012 to December 2014. We compared pain and complications in 3 treatment arms, *i.e.*, GA group, lidocaine group, and lubricating jelly group.

Results: The mean pain score was similar in the 3 studied groups ($p=0.8$). No significant differences in frequency of complications was observed among the studied groups ($p=0.93$).

Conclusion: Double J removal with rigid cystoscopy and topical anesthesia in male patients after KTx is safe and feasible with lower cost and less morbidity.

KEYWORDS: Kidney transplantation; Rigid cystoscopy; Double J; Anesthesia

Studying Brain Death in Shahid Kamyab Hospital of Mashhad: 2013–2015

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Background: The mean world's statistics for organ donation is 34 individuals per million; this figure is only 1.7 per million in our country. The main challenge for organ transplantation is organ shortage.

Objective: In this study, brain death and organ donation were studied since March 2013 for two years at Shahid Kamyab Mashhad Educational and Research Center.

Methods: This cross-sectional study was carried out with a complete census of all patients whom brain death had been declared at the ICU of Shahid Kamyab Mashhad Educational and Research Center since 2013 until March 2015. The data collected were analyzed using SPSS 12 software.

Results: The results showed that 85 patients were declared brain-dead, among whom only 17 were transferred to an organ transplant center for organ donation. The age of these patients varied from 5 to 81 years; 67 patients suffered from trauma and poisoning; falling down and suicide were other common causes of death.

Conclusion: In our center, most of patients with brain death, eligible for organ transplantation, die and the opportunity for organ donation is lost. Appropriate programs in radio, television, and other media should be developed to inform people of transplantation, brain death and other relevant issues.

KEYWORDS: Brain death; Organ donation; Nurse

Dental Management of Patients before and after Kidney Transplantation

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Kidney transplantation is a preferred treatment for patients with end-stage renal disease (ESRD). Infection from a dental source is a potential threat for both organ transplant candidate and recipient because oral disease is common; it is also likely to be more severe if left untreated in the transplant recipients. The patients who underwent transplantation need special dental care. The reduced defense of their body as well as their already compromised health put them at high risk of developing a plethora of systemic and stomatological diseases. Infection continues to be one of the causes of graft loss in transplant recipients. Untreated dental disease represents a potential risk of infection in transplant patients. For this reason, first and foremost, there should be a cooperation between the treating nephrologist and the dentist so as to form a targeted dental therapy plan. Dental management during pre-transplantation or pre-conditioning phase should include oral and dental evaluation and identifying the foci of infection. The aim is for the patient to get physiologically ready for transplantation while having a healthy mouth. This review summarizes dental management of patients before and after transplantation.

KEYWORDS: Renal transplantation; Dental care; Oral health

The Effect of Renal Transplantation on Respiratory Muscle Strength in Patients with End-Stage Renal Disease

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Background: The respiratory system is affected in patients with chronic kidney disease. Not only does renal failure, itself, but also the necessary therapeutic procedures, such as peritoneal dialysis or hemodialysis, affect the respiratory system. These patients usually have decreased protein calorie reception that results in muscular atrophy and protein imbalance. Calcification of the respiratory muscles results in abnormal spirometry findings.

Objective: To evaluate the respiratory muscle strength in patients with chronic kidney disease before and after transplantation.

Methods: This study is a review article provided by library and the Internet resources.

Results: The commonest application test to evaluate the respiratory muscle strength is measuring PIMAX

(diaphragm and other inspiratory muscles strength index) and PEMAX (expiratory muscle strength index). Many studies have shown an increase in PIMAX and PEMAX in 30 to 90 days after renal transplantation, which is due to removal of uremic effect on respiratory muscles. Also, some studies showed that the residual volume and total lung capacity in patients undergoing hemodialysis or peritoneal dialysis is more than transplanted patient that would be attributed to the inflated lung due to small respiratory duct involvement. This problem improved greatly after transplantation. On the other hand, since PIMAX and PEMAX above 60% is considered normal, some studies assert that despite improvements in maximal inspiratory and expiratory pressure after transplantation, these parameters were less than 60% that showed that even after a successful kidney transplant, there is still degrees of muscle weakness. This has been attributed to immunosuppressive therapy such as corticosteroids, which led to decreased muscle protein synthesis that prevents full recovery of muscle fibers after kidney transplant. The less mobile lifestyle and lack of systematic rehabilitation program after a kidney transplant may also have negative effects on the outcome.

Conclusion: Based on these results, we can conclude that the muscle weakness after kidney transplantation, in patients with chronic kidney disease can be recovered to some extent.

KEYWORDS: Chronic renal failure; Respiratory muscles; Renal transplantation

ICU Nurse's Knowledge, Attitude, and Practice towards Nurse's Role in Organ Donation Process from Brain-Dead Patients and Factors Influencing it in Iran

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Background: Nowadays, ICU nurses play a key role in the care of brain-dead patients and their families. Therefore, their knowledge, attitude and practice are extremely important to the success of organ donation.

Objective: To assess ICU nurse's knowledge, attitude and practice towards nurse's role in the organ donation process from brain-dead patients and factors influencing it in Iran.

Methods: In a cross-sectional study, 90 ICU nurses from Ghaem and Emam Reza Hospitals affiliated to Mashhad University of Medical Sciences were selected through a stratified random sampling. Data collection tools included a questionnaire on demographic information, factors influencing nurse's knowledge, attitude and practice towards organ donation process and surveying nurse's knowledge, attitude and practice in relation to their roles in the organ donation process.

Results: 90 nurses participated in this study. 70% of the nurses had spoken with their own families about organ donation, and 20% had organ donation cards. The mean±SD score of nurses' knowledge was 49.1±9.6, attitude score was 21.5±14.3, and practice score was 3.7±6.0. 80% of the nurses had an average level of knowledge about their roles in the organ donation process; 82% agreed with their roles in this process, and 97% showed weak practice in this regard.

Conclusion: As a result, studied nurses did not have adequate knowledge and attitude towards nurse's role in organ donation process. Their practice was also lower than that expected. We suggest to include organ donation process and organ transplantation in nursing training curricula. Moreover, educational programs to acquaint nurses with their roles in organ donation process seems necessary to improve their attitude and practice.

KEYWORDS: Nurse's role; Organ donation; Process; Brain death

Bacterial Infections in Kidney Transplant Recipients

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Background: One of the primary and major aims in organ transplantation is to effectively prevent or treat infections. In the previous two decades, significant advancements have been made in the management of infection after transplantation; however, transplant recipients are at high risk of infectious complications.

Objective: To evaluate the prevalence of bacterial infections and frequency of antimicrobial resistance in kidney transplant recipients.

Methods: This retrospective study conducted on 356 patients receiving kidney in transplant hospital of Montaserieh, Mashhad, regardless of the underlying cause for a period of 24 months from March 20, 2013 to March 20, 2015. We studied cultures relevant to the samples sent to the microbiology laboratory.

Results: Of 356 kidney recipients (206 men and 150 women), 115 (32.3%) received their transplants from a living donor; 241 (67.7%) received their transplants from a brain-dead patient. Of the total 365 patients, 112 (31.5%) had positive blood cultures at various time intervals after transplantation. The most common Gram-negative and Gram-positive organisms causing infection were respectively, *Escherichia coli*, and coagulase negative Staphylococcus with a prevalence of 66.1%, and 48.6%. The highest and lowest antibiotic resistance among Gram-positive isolates was nalidixic acid (100%), and nitrofurantoin (41.5%), respectively; The antibiotics for Gram-negative bacteria was amoxicillin (93.2%), and meropenem (14.7%), respectively.

Conclusion: Due to the a high prevalence of infection in transplant recipients, appropriate antibiotic should be found before prescribing the drug; this would prevent introduction of new resistant strains as well as proving an effective use of the drug.

KEYWORDS: Kidney transplantation, antibiotic resistance, bacterial infection

Effect of Two Educational Methods – Workshop and Context-Based Learning – on Nurses’ Knowledge, Attitude and Practice towards their Role in Organ Donation Process

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Background: The increasing rate of organ donation throughout the world and in our country has expanded the role of nurses, so that nowadays, the focus of nursing has shifted from special care nursing to nursing in the organ donation process.

Objective: Because the success of organ donation process is closely related to the knowledge, attitude and practice of nurse’s towards the process, this study was conducted to compare the effect of two teaching methods—workshop and context-based learning—on nurse’s knowledge, attitude and practice towards their Role in organ donation process.

Methods: In this clinical trial, through random assignment, 3 ICUs of Ghaem Hospital, affiliated to Mashhad University of Medical Science, were assigned to context-based learning (CBL), and 6 wards were allocated to workshop group. Then through a stratified random sampling, 60 ICU nurses were entered into the study.

The CBL training (for 30 nurses) was performed in 3 sessions each lasted for 2 hours. The time between two sessions was 1 week. In workshop group (for 30 nurses), intervention was performed in two stages: every stage lasted for 3 hours; there was 1 week between the two stages. Both group before and 1 month after the intervention completed a questionnaire assessing their knowledge, attitude and practice towards nurse's role in organ donation process.

Results: Both interventions increased the nurses' knowledge, however, the increase was significantly ($p < 0.001$) higher in CBL group (43.4 ± 13.1) compared to workshop group (14.3 ± 4.0). The same was true for score of attitude (28.7 ± 21.2 in CBL vs. 13.1 ± 8.7 in workshop group) ($p < 0.001$), and practice (73.6 ± 21.1 in CBL vs. 23.3 ± 6.8 in workshop group) ($p < 0.001$).

Conclusion: Based on obtained results, CBL was more effective than workshop in increasing knowledge, attitude and practice of nurses towards their role in organ donation process.

KEYWORDS: Knowledge; Attitude; Practice; Organ donation process

Augmentation Cystoplasty before Kidney Transplantation: A Comparison between Enterocystoplasty and Ureterocystoplasty with a Control Group

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Background/Objective: In this study we compared the outcome of patients who underwent one of the two surgical methods of bladder augmentation, *i.e.*, enterocystoplasty (EC) and ureterocystoplasty (UC) before kidney transplantation, with recipients of kidney who had normal bladder function.

Methods: During a 26-year period (1988–2014), 2100 renal transplantations were performed in our center by a fixed team. In 22 patients (mean age 19.5 years) enterocystoplasty (group A) and in 12 patients (mean age 12.3 years) ureterocystoplasty (group B) were performed before renal transplantation. These two groups were compared with a control group of 34 recipients with a normal bladder (group C, mean age 17.6 years) for kidney function, graft and patient survival and episodes of urinary tract infection.

Results: There was normal graft function in 15, 10, and 31 patients in groups A, B, and C, respectively during a mean follow-up of 92, 73, and 82 months ($p < 0.8$). The mean \pm SD serum creatinine in follow-up was 1.58 ± 0.35 , 1.42 ± 0.15 , and 1.31 ± 0.51 mg/dL in groups A, B, and C, respectively. There were no statistically significant differences among the 3 groups in terms of 1, 5, and 10-year graft and patient survivals. Episodes of febrile UTI requiring hospital admission were 23, 7, and 2 in groups A, B, and C, respectively. UTI and urosepsis were significantly more frequent in group A than group B ($p = 0.035$) and group C ($p = 0.001$); however, there was no significant difference between groups B and C ($p = 0.330$).

Conclusion: Although augmentation cystoplasty with segment of intestine or dilated ureter is a safe and effective procedure for reconstruction of lower urinary tract before renal transplantation, in recipients with enterocystoplasty the frequency of febrile UTI and urosepsis is high; sometime it is dangerous. In long-term, there is no significant difference in graft function among the 3 groups. As a result augmentation cystoplasty (either method) is recommended before renal transplantation for reconstruction of lower urinary tract.

KEYWORDS: Kidney transplantation; Enterocystoplasty; Ureterocystoplasty

Vascular Complications Following Kidney Transplantation: Experience from 2100 Recipients

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Background: Vascular complications during kidney transplantation are the major cause of graft loss. Immediate surgical intervention is very important for salvage of the graft and recipient.

Objective: To present our experience of vascular interventions and their affects on the outcome of grafts in transplanted patients with suspected vascular events.

Methods: During 24 years (1990–2014), 2100 renal transplantations (1562 live and 438 deceased donors) were performed by a fixed team. We reviewed the recipients to find cases with vascular complications like artery or vein kinking or torsion, renal artery thrombosis (RAT), and renal vein thrombosis (RVT). Diagnosis of vascular event was suspected when urinary output suddenly stopped and confirmed by color doppler ultrasonography or immediate exploration. Kind of surgical interventions for saving grafts and their outcomes were assessed.

Results: A total of 28 (1.3%) vascular accidents occurred. Arterial kinking, RAT, and RVT occurred in 9 (26%), 2 (0.5%) and 2 (0.5%) patients, respectively. RAT and RVT occurred in 12 (34%) and 3 (1.5%), respectively. 8 of 9 arterial kinking occurred in cases in whom we used internal iliac artery. The mean±SD time interval between anuria and surgery was 30±10, 50±10, and 65±20 minutes for vascular kinking, RAT, and RVT, respectively. 11 out of 13 grafts with vascular kinking or torsion were saved by immediate surgical intervention. Only 4 grafts of RAT group and 2 grafts of RVT group could be saved by surgical intervention. In RAT cases, we reopened the anastomosis and performed a very small venotomy. Then we washed and perfused graft with heparinized ringer solution and finally revascularization was restored. Delayed graft function occurred in all cases of saved RAT and RVT, however, it did in only 5 (4%) cases of kinking or torsion vascular cases.

Conclusion: Sudden cessation of urine after renal transplantation is a warning sign and immediate diagnosis of vascular event will help salvage graft with proper intervention.

KEYWORDS: Kidney transplantation, graft survival; Vascular complications

Graft Immunotherapy using Stem Cells

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The immune system is one of the most effective ways to combat foreign agents in the body, which results in graft rejection or GVHD reactions following allogeneic transplantations. Understanding the cellular and molecular mechanism of rejection is a prerequisite of achieving effective therapeutic strategies. At present, immunosuppressive drugs are most common and available therapy to maintain the transplanted organ; however, the systemic suppression of the immune system following this therapeutic strategy is one major complication that graft recipients suffer from. Therefore, new therapeutic methods that act more specifically with less side effects are highly demanded. In between, mesenchymal stem cell with immunosuppressive properties has opened new promising

avenues. Studies show that mesenchymal stem cells can regulate the immune response through inhibition of proliferation and functions of immune cells, such as T, B, NK, and dendritic cells, as well as the production of immune regulatory factors such as IL-4, and IL-10. This study presents a comprehensive review of the mechanisms behind graft rejection and the way by which mesenchymal stem cells regulate the immune response and prevent graft rejection.

KEYWORDS: Graft; Rejection; Stem cell; Immunotherapy

Short Limb Roux-en-Y- Hepaticojunenostomy in Orthotopic Liver Transplantation in Four Cases

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Background: Biliary reconstruction is an important step in liver transplantation procedure and may cause most prevalent complications. In a number of cases duct-duct reconstruction is not feasible due to pathological changes of the distal duct or discrepancy. Roux-en-Y hepaticojunenostomy is an alternative method in these cases and classic procedure is a 60-cm limb.

Methods: We performed short limb Roux-en-Y hepaticojunenostomy (30 cm after treitz lig. cut. distance between hepaticojunenostomy and jejunojejunostomy was 20 cm) in 4 cases during liver transplantation.

Results : This study had only 4 cases. The last 2 patients developed hepatic artery thrombosis in the first post-op day; both underwent retransplant due to graft necrosis. Although, they survived, we stopped this procedure. Now all cases are alive without any biliary complications and with normal lab data.

Conclusion: Short limb Roux-en-Y hepaticojunenostomy can help us to manage post-op biliary complications with ERCP. However, we need more detailed evaluation for determining the efficacy and safety of this procedure.

KEYWORDS: Roux-en-Y hepaticojunenostomy; Biliary reconstruction

Self Care Educational Needs of Kidney Transplant Recipients

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Background/Objective: This study was carried out to determine the self care educational needs of kidney transplant recipients. We emphasized more on cognitive, affective, and psychomotor educational needs.

Methods: In this cross-sectional study, 100 kidney transplant recipients who referred to our center in Tabriz for follow up, were studied. We used a purposive sampling method. Data were collected through questionnaires and checklists. The questionnaire consisted of four parts: (a) demographic data, (b) affective needs, (c) cognitive needs, and (d) psychomotor needs.

Results: More than 92% of studied patients felt they need education in affective domain, 39% in cognitive and 29.6% in psychomotor domain. Some factors such as age, sex, educational level, marital status, occupa-

tion place of residence had significant effects on the patients' educational needs. Compared to others, older patients, women, married people, housekeepers, unskilled workers and rural residents needed more education. Time elapsed from the transplantation, history of being hospitalized after transplantation, and period of hospitalization had no effect on the patient's educational needs.

Conclusion: In establishing training courses educational needs of transplant recipients should be considered.

KEYWORDS: Patient education; Self care; Kidney transplantation

Uterine Transplantation

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The first uterine transplantation was performed in Denmark in 1931. Indications for uterine transplantation includes congenital uterine hypoplasia (Rokitansky syndrome), acquired abnormality of the uterus, Asherman's syndrome, hysterectomy due to post-partum hemorrhage, and benign or malignant diseases. Normal pregnancy and healthy newborn were reported after uterus transplantation. An ideal recipient is a female of reproductive age with suitable medical and psychological conditions who understands well risks of the procedure. Ideal donor candidate are relative (preferred, less risk for immunosuppression) dead or brain-dead postmenopausal women, and the recipient's mother. Uterus is not a vital organ. Unlike transplantation of vital organs such as heart, kidneys, uterine transplantation is not life-saving. However, it should be considered a means to improve the quality of life. In addition, it is a temporary transplant and must be removed after giving birth to one or two children. The recipients should be informed that they may need to undergo three major surgeries: the first, the surgery for transplantation; the second, a cesarean section if pregnancy occurred; and a third to remove the uterus after completion of childbearing. However, possibility of organ rejection, assisted reproduction, teratogenic effects of the immunosuppressive therapy are other risks to be considered. Furthermore, donors must be aware of surgical risks associated with this procedure.

KEYWORDS: Uterine transplantation; Complications; Review

The Importance of the Nurses' Role in Patient Education in Organ Transplantations

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Background: Patient education is one of the most significant roles nurses play in patient education. It can lead to many positive health outcomes, including improved quality of life of patients. Transplantation imposes a lot of stress on patients. The stress may be due to lack of patients' knowledge concerning medica-

tion, signs of rejection, and how to prevent negative consequences of life-long immunosuppressive medications, post-operative pain, *etc.*

Methods: The study is a review conducted to evaluate the importance of the nurse's role in patient education in organ transplantation. The search was done between 1990 and 2015 using various electronic databases.

Results: Education programs for patients improve all dimensions of quality of life, enhance self efficacy, confidence of care continuation, coping with disease, and decrease symptoms. Education is a low cost and simple method. Also the patients have better knowledge and positive coping post-education.

Conclusion: Patient education is a major responsibility of nurses. Continuous education should be provided for patients by the health care team, especially nurses.

KEYWORDS: Nurses; Patient education; Transplant

Effect of Ureteral Complete Duplication on Ureteral Complications in Cadaveric Kidney Transplant Recipients

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Background: Ureteral complications are well known in kidney transplantation. Significant number of cadaver donors have ureteral duplication.

Objective: We evaluated effects of this variation on recipients' kidney function and ureteral complications.

Methods: We evaluated recipients during 3 years in two transplantation centers. The study included 18 recipients with duplicated ureters of their transplanted kidney. Serum creatinine and ureteral leakage or stricture were evaluated for all recipients. The surgical technique was anastomosis of two ureters to each other with single sheath and to recipients bladder by using two double J stents (mean follow-up of 10 months).

Results: The mean serum creatinine was nearly the same as other recipients (with single ureter), lymphocele or ureteral leakage was seen in 8 (44%) patients and only 2 (11%) recipients needed percutaneous aspiration. No ureteral stricture was identified during the follow-up.

Conclusion: Our study showed that ureteral duplication has no significant effects on ureteral complication and renal function in kidney transplant recipients.

KEYWORDS: Ureteral duplication; Kidney; Transplantation

Effects of Body Mass Index (BMI) on Wound Healing after Kidney Transplantation

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Background: The weight of many kidney transplant recipients is more than the optimal value for transplantation. After kidney transplantation, the wound of such overweight patients may need more time for healing.

Objective: We evaluated the effects of obesity (BMI \geq 30 kg/m²) on wound healing after kidney transplantation.

Methods: From June 2010 to October 2013, we evaluated 152 kidney recipients. 48 (31%) recipients were obese (group A); the BMI of 104 (69%) recipients was <30 kg/m² (group B). All patients with wound infection were excluded from the study. Surgical sutures were removed two weeks after transplantation for all kidney recipients.

Results: In group A (obese recipients, n=48), 17 (35%) patients needed resuturing or more care for uncompleted wound healing. In group B (control group, n=104), only 8 (7.6%) patients needed resuturing (p<0.05).

Conclusion: BMI more than 30 kg/m² (obesity) is a significant risk factor for wound healing. Suture removing for these recipients after 3 weeks or even more may decrease wound complications in kidney transplant recipients.

KEYWORDS: Body mass index; Kidney transplantation; Wound

Laparoscopic Donor Nephrectomy: Report of the First 2 Cases in Khorasan

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Background: Renal transplantation is the ideal solution to end-stage renal disease. Living donor kidney transplantation offers substantially superior graft function and survival compared to cadaveric renal transplantation. Other advantages over cadaveric renal allografts include shorter time in waiting list for transplantation, the ability to schedule it as an elective procedure, and thus optimize the medical status of the recipient, and overall reduced immunosuppression requirements. In transplant centers today, donor nephrectomy is done via either a laparoscopic or an open surgical approach. Prior to 1995, the standard method of kidney procurement was open donor nephrectomy performed through a flank or subcostal incision. Although this procedure can be performed safely and produces an allograft of excellent quality with minimal warm ischemia, it is associated with considerable peri-operative morbidity for the renal donor. Post-operative pain, prolonged hospitalization, and convalescence, lost wages, and poor cosmesis have been identified as significant disincentives for organ donation. The first series of laparoscopic living donor nephrectomies were performed in 1995, specially intended to decrease the morbidity of renal donation for the healthy donor and thus reduce disincentives and expand the pool of live donor candidates.

Methods: Two patients underwent left laparoscopic transperitoneal nephrectomy in lateral decubitus. After trocar placement, the white line of Toldt was incised. Once the descending colon, pancreas, and spleen were mobilized and reflected medially *en bloc*, hilar dissection was done. The extraction site was prepared by making a 5-6 cm Pfannenstiel incision. The ureter and its well preserved periureteral tissue packet were transected distally at the level of the iliac vessels using hemoclips. Both renal vein and artery were divided between hemoclips. The specimen was extracted from Pfannenstiel incision.

Results: These are the first cases of donor nephrectomy in Khorasan. The procedures were completed successfully without any complications. The operation time was 90-100 min. Warm ischemic time were about 5-6 min.

Conclusion: Laparoscopic living donor nephrectomy is now the standard technique at many transplant centers, resulting in less post-operative pain and convalescence for the living donor while maintaining equivalent allograft function and recipient outcomes as compared with results from traditional open donor nephrectomy.