Surgical complications of renal transplantation with emphasis on the urological aspects

Thesis
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Abstract

Introduction: Surgical complications of renal transplantation in spite of decades of practice still occur and represent a real threat to the patient and the graft survival.

Aim of the work: To find out the incidence and nature of surgical complications in a particular group of patients and compare it with other published series.

Patients and methods: This is a retrospective study that included 115 cases of renal transplantation done in King Fahd unit, Kasr El Aini hospital, Cairo University during the period from 2009 to 2012. Revision of the files of those patients recording complications, incidence diagnosis, management and outcome of treatment

Results: Complications were recorded in 17 cases (14.78%). Urologic complications occurred in 5 cases (4.35%), Vascular complications in 6 (5.22%) and lymphocele in 6 cases (5.22%).

Conclusion: Monitoring for surgical complications after renal transplantation is critical. Early diagnosis and appropriate timely intervention are crucial to minimize the effect on the graft and on the recipient.

Key Words:

Renal Transplantation, Surgical complications, Lymphocele.

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Dedication

I would like to dedicate this work to my mentor & professor

Dr Mahmoud El Sherbiny

for without his inspiration, fatherly coaching & help none of this would have happened.

Contents

Introduction

Renal transplantation is the treatment choice for most patients with end-stage renal disease (ESRD). Graft and patient survival rates have significantly improved during the last three decades due to refinement of surgical technique as well as new potent immunosuppressive regimens. One-year graft survival for live-donor kidney recipients is 90-95%, and for deceased donor recipients is 85-90%. Overall, 1-yr patient survival is 95% ***(Humar et al, 2005).***

Although kidney transplantation is described as the best treatment modality and in spite of the advanced and improved diagnostic interventions, surgical complications remain a great concern and a significant clinical issue that increases morbidity and costs and potentially lead to graft loss ***(Hernandez et al, 2006).***

The overall incidence of surgical complications after renal transplantation is low; most centers report an average incidence of **5-10%** ***(Humar et al, 2005)***. Early diagnosis and treatment of surgical complications is necessary to minimize the impact on graft function and on the recipient. All the persons involved in the care of the transplant recipients must be aware of the surgical complications of the transplant.

As with other surgeries, postoperative hemorrhage, wound complication may be seen in kidney transplant operation. However, there are some transplant-related surgical complications unique to kidney transplantation recipients, which can be

categorized as vascular, urologic and lymphatic. Vascular complications represented **1-2%** of postoperative complications, including renal artery thrombosis, renal artery stenosis and renal vein thrombosis with spontaneous graft ruptures ***(Kocak et al, 2004)***. Urological complications were reported in a range between **2.6** and **15%** in some large cohort studies ***(Mahdavi et al, 2007)***. Ureteral leaks and stenosis being the most frequent ***(Sansalone et al, 2005)***. The average clinical incidence of lymphorrhea and lymphocele is uncertain in large series varying from **0.6 to 16%** ***(Adani et al, 2007; Zargar et al, 2008; Zietek et al, 2009)***.

History of Renal Transplantation

The history of renal transplantation illustrates the successful combination of the fields of surgery, medicine and immunology. Major advances pioneered by Alexis Carrel in the late nineteenth century paved the way for vascular surgery. Carrel established the modern method of vascular suturing at the turn of the 20th century, and he was awarded the Nobel Prize in 1912 for his work on organ grafting ***(Hamilton, 2001)***.

Experience with cadaveric kidneys in the late 1940s and early 1950s in the Ukraine, Paris and Boston resulted almost uniformly in allograft failure and the demise of the patient ***(Hamilton et al, 1984).*** Even if the transplants functioned initially, the immunological rejection ultimately destroyed the kidney ***(Medawar et al, 1944).***

The first known living donor kidney transplantation was performed in Paris in 1952 at Hôpital Necker, a 16-year-old boy received a kidney from his mother (the first living related donor). Function was maintained with resolution of uremic symptoms until rejection and death ensued three weeks later. The first long-term success with human renal allografting, in which the patient survived for over a year, occurred in Boston in 1954, when a kidney from one twin was transplanted into the other. The standard kidney transplant procedure is the pelvic operation originally used by French surgeons Küss, Dubost, and Servelle and their associates in 1952 and refined subsequently by Murray

and Harrison for the first successful kidney transplantation in human history ***(Murray et al, 1955).*** Murray received the Nobel Prize in Medicine in 1990 for his pioneering work in renal transplantation.

Although the first successful transplant occurred against a backdrop of repeated failures, it undoubtedly laid the cornerstone for modern transplantation. In the years that followed, efforts to enable renal transplantation between non-twin pairs (allografts) were pursued with renewed vigor. In 1959, the first long-term success (27 years) was achieved using radiation to suppress the immune response to a living donor transplant ***(Merrill et al, 1960)***.

In 1958 the first histocompatibility antigen was described. Glucocorticoids became part of a standard immunosuppression regimen with azathioprine in 1962 ***(Goodwin et al, 1963).*** In the same year, the first use of tissue matching to select donor-recipient pairs was done. The direct cross match between donor lymphocytes and recipient serum was introduced in 1966.

The first clinical trials of cyclosporine were reported by Calne and colleagues in 1978, and 3 years later there were reports of the successful use of a monoclonal antibody for the treatment of renal allograft rejection in humans ***(Cosimi et al, 1981).***

Laparoscopic donor nephrectomy was introduced in 1995. (***Pradel et al, 2003)*** and in the past decade the outcome of kidney transplantation has improved markedly. As a result, transplantation has become the mainstay and preferred treatment for patients of all ages with end-stage renal disease.

In Egypt, the first renal transplantation was performed at Al-Mansoura University Hospital in 1976; it was a living related renal transplant. Six months later the next successful transplant was performed in Cairo university hospital (Kasr El Aini).Since that time thousands of renal transplantations have been done throughout the country. In Egypt all transplants are living donors, cadaveric donors although legalized yet not practiced until now.

I. Review

A. Surgical technique

Surgical operation is the first critical step of a successful kidney transplant. Attention to surgical detail and strict adherence to basic operative principles of asepsis and hemostasis may help in avoiding of the majority of preventable surgical complications and related morbidity and mortality ***(Neipp et al, 2008)*.**

The standard kidney transplant procedure is the pelvic operation originally used by French surgeons Küss, Dubost, and Servelle and their associates in 1951 and refined subsequently by Murray and Harrison. The heterotopic pelvic approach has been widely accepted for its multiple advantages and considered a standard access. The classical surgical techniques of revascularization and urinary tract reconstruction have also been broadly used to this day. Each renal transplantation operation is a review of original historic work both in urological and vascular discipline ***(Zhao et al, 2011)***.

At the time of anesthesia, a Foley catheter is placed in the bladder. A urine sample is sent for culture or a bladder wash in the case of an anuric patient. The bladder is then filled by gravity with 100–200 cc of a 1% neomycin solution, and then the catheter is clamped. The operative site and one groin is shaved and prepped with an iodine solution for 10 min. One groin is always isolated should there be need for a saphenous vein conduit ***(Kadotani et al, 2005)*.**

A lower-quadrant pelvic Gibson incision is made extending from the midline above symphysis pubis to above the