

# Incisional Hernia after Renal Transplantation and Its Repair with Propylene Mesh

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## ABSTRACT

**Purpose:** Kidney recipients are susceptible to incisional hernia. We studied predisposing factors for incisional hernia in our patients and the results of its repair with propylene mesh.

**Materials and Methods:** From 1989 to 2002, 589 patients had undergone kidney transplantation in our hospital. Of these, patients who developed incisional hernia were evaluated in this study. The following data were collected from their records: age, gender, weight, age at graft rejection, surgical complications, treatment method, and the treatment results with propylene mesh.

**Results:** Of 589 recipients, 16 (3%) developed incisional hernia in surgical site. The median interval between kidney transplantation and developing of incisional hernia was 48 (range 12 to 425) days. Predisposing factors were overweight, age over fifty years, and female gender ( $P < 0.005$ ). In four patients, hernia was small, and the repair was performed without using mesh. Three patients were reluctant to hernia repair, and in 9, due to the large size of hernia, repair was done using propylene mesh. Having these 9 patients treated with propylene mesh, 2 developed serous collection in surgical site, which were managed successfully with multiple punctures. Hernia recurrence or infection was not noted in these patients during 3 to 36 months follow-up periods.

**Conclusion:** Incisional hernia is not a rare entity after kidney transplantation. Predisposing factors, such as overweight, age over 50 years, and female gender have a role in its development. Also, repeated surgeries in kidney recipients can increase the risk of incisional hernia. Managing this complication with propylene mesh is a safe and effective method.

**KEY WORDS:** incisional hernia, kidney transplantation, propylene mesh

## Introduction

Incisional hernia is a prevalent complication in kidney allograft recipients, due to prolonged dialysis, immunosuppressive drugs, especially, corticosteroids, and high prevalence of diabetes. Overall incidence rate of incisional hernia after abdominal surgery in normal population is 2% to 13%.<sup>(1-3)</sup> But, its incidence after kidney transplan-

tation is unclear. Incisional hernia repair following an abdominal surgery without using mesh, leads to a higher recurrence rate (30 % to 50%). Since the introduction of propylene mesh for repair of incisional hernia by Usher in 1958, the recurrence rate has reduced to 10%.<sup>(4,5)</sup> The use of immunosuppressive drugs increases the chance of infection with synthetic materials such as propylene mesh. On the other hand, using mesh in order to prevent hernia recurrence in patients with multiple predisposing factors is necessary. Unfortunately, there is little information

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regarding the use of propylene mesh in incisional hernia after kidney transplantation. In this study, we report our experience in incisional hernia repair after kidney transplantation, using propylene mesh.

### Materials and Methods

In a 12-year period, from 1989 to 2002, 630 kidney transplantations had been done in our hospital. Of these, 41 cases were in the patients who had received a second kidney allograft in this center. We retrospectively studied all cases of incisional hernia. Median age of the recipients was 31 (range 6 to 68) years. Of recipients, 384 were male and 195 were female. Kidney allografts were from living donors in 620 cases and cadaver in 10 cases.

In kidney transplantation, paramedian incision was used, so that muscle splitting would not be required i.e. access to pelvic space would be provided by incising the fascia of internal or external oblique muscles or transverse muscle. Arterial anastomosis of kidney allograft to internal or external iliac artery and end to end venous anastomosis were performed in pelvis. In all the patients, two hemovac drains were inserted into surgical sites, one in the upper portion of incision in retroperitoneum and the other, adjacent to the ureterovesical anastomosis. Fascia was repaired in two layers with nylon-0 using continuous suture in adults and interrupted sutures in children. In patients who had copious subcutaneous fat, a third subcutaneous drain was placed for 2 to 3 days. Sutures were removed 14 days after transplantation. Our immunosuppression protocol was 3-drug regimen with cyclosporine, azathioprine, and prednisolone. Recently, in some patients, azathioprine was replaced with mycophenolate mofetil, due to its lower complication rates. In case of acute rejection, methylprednisolone 1 gr per day would be administered for three days and in the refractory cases, anti-lymphocyte globulin would be used. After discharge, all of the patients were followed periodically. In cases with incisional hernia, patients were referred to the surgeon and evaluated regarding weight, presence of diabetes mellitus, age, gender, previous history of acute rejection, surgical complications such as hematoma, lymphocele, infection, and the size of hernia and its impact on patient.

Patients with relatively large incisional hernia in transplantation site underwent hernia repair

with the assistance of a general surgeon, using propylene mesh, preceded by informing them of the possible complications. Propylene mesh was used with two methods; if approximation of fascial edges was possible mesh would be placed on the fascia—this method was applicable only in 2 cases. When hernia was extensive (in 7 cases), the edges of fascia were identified, peritoneum was repaired, and while mesh was placed on peritoneum, it was sutured to the edges of fascia with nylon-0 sutures. Before closure of the wound, a hemovac drain was inserted over the mesh, remaining for 2 to 3 days. All patients received broad-spectrum antibiotics perioperatively and were followed in the first, third, and sixth postoperative months and some were followed up to 6 years. Statistical analysis was done with student t test and chi-square test. A P value less than 0.05 was regarded significant.

### Results

Of 589 recipients, 16 developed incisional hernia. Of these, 4 had small size incisional hernia, which was repaired without using mesh. Three were reluctant to hernia repair, and the nine remainders underwent hernia repair with the use of propylene mesh, due to the large size of hernia.

#### *Developing time of incisional hernia*

In a 52-year-old obese woman, wound dehiscence and evisceration of bowels occurred in the first post-transplantation week. Although primary repair was performed, incisional hernia developed four weeks later. Due to the large size of hernia and the thinned skin overlying the hernial sac, extensive hernia repair was done 4.5 months after transplantation. In this patient, nearly the entire abdominal wall was covered with propylene mesh. Figures 1 and 2 demonstrate the incisional hernia before and after repair. In 5 patients hernia was diagnosed in the first few weeks postoperatively and in 10 patients, it was detected 3 weeks to 6 months later. Finally, incisional hernia developed in the second post-transplant year in 1 case.

#### *Predisposing Factors*

*Gender:* Of 16 patients, 11 (70%) were male and 5 (30%) were female (P = 0.02).

*Age:* Twelve patients were above 50 years old, and 4 were 50 or less (P = 0.05).

*Obesity:* Eight patients were over 75 kg, and 8 were less than 75 kg. Body mass index was not measured in this study. However, 75% of women



Fig. 1. A 52-year-old woman with incisional hernia, 1 month after kidney transplantation

with incisional hernia were apparently overweight.

*Diabetes mellitus:* Of 16 patients with incisional hernia, 5 were diabetic ( $P = 0.2$ ).

*Post-transplantation surgical complications:* In 2 patients, urinary fistula developed and after surgical repair of fistula, incisional hernia occurred. In one kidney recipient, after the repair of lymphocele, an incisional hernia was formed. Daily corticosteroid doses during incisional hernia were 10 to 60 mg. Three patients received short-term high dose methylprednisolone, due to acute rejection.

#### **Complications after incisional hernia repair with mesh**

After hernia repair with propylene mesh, serous fluid collection was formed in two cases, which were treated successfully with multiple punctures. Infection or recurrence was not observed postoperatively.

### **Discussion**

The general prevalence of incisional hernia is 2% to 13%.<sup>(1,3)</sup> Its predisposing factors are age, obesity, alcoholism, smoking, emergency surgeries, foreign body implantation, wound infection, hematoma, technical error, and unsuitable suture material. In addition, medical illnesses such as chronic renal failure, liver insufficiency, and pulmonary diseases are among predisposing factors.<sup>(6-8)</sup> In patients with chronic renal failure, who have undergone kidney transplantation, multiple factors interfere with wound healing, such as long-term uremia, malnutrition before kidney transplantation, and administration of corticosteroids and azathioprine, postoperatively. The prevalence of incisional hernia in our patients was 3%. In other studies, the reported prevalence



Fig. 2. Incisional hernia repair. Nearly the entire abdominal wall is covered with propylene mesh.

of incisional hernia after kidney transplantation is between 2% and 3.8%.<sup>(4,7)</sup> Incisional hernia is not a rare entity after kidney transplantation. Detecting predisposing factors and subsequently, meticulous surgical operation can reduce its prevalence. It can occur immediately or some years postoperatively, but in more than half of the cases, it develops in the first postoperative three months, and in up to 70% it occurs in the first postoperative year. Only in 10% it develops between one to five years after transplantation.<sup>(4,5,9)</sup>

In our patients, 95% (16) of cases were seen within 6 months after kidney transplantation and only one patient developed incisional hernia one year post-operatively. In a 52-year-old woman wound dehiscence occurred in the first post-transplantation week that was accompanied by evisceration. Urgent surgical repair was done, but after 3 weeks, when she was discharging, an extensive incisional hernia had occurred (fig. 1). Hernia gradually increased within 3 months causing problems with walking, and the majority of bowels were in hernial sac. Four months after kidney transplantation, her incisional hernia was repaired successfully with propylene mesh. In a 35-year-old male, surgery was complicated by lymphocele. His large lymphocele was marsupialized into peritoneum 4 weeks after kidney transplantation, but in the second month of follow-up, an incisional hernia was detected. Of 16 patients with incisional hernia, 11 (70%) were female and most of them were over 50 years old and weighed over 75 kg. It seems that, gender, age, and weight are among important predisposing factors for incisional hernia.

Doubtlessly, corticosteroids play an important role in developing incisional hernia, because they can interfere with wound healing. Long-term use

of corticosteroids, especially during acute rejection, in which higher doses of methylprednisolone (1gr/ daily) are administered, has a considerable impact on developing incisional hernia.<sup>(6,10)</sup> Of 16 patients in our study, four suffered from acute rejection and received high dose methylprednisone. Other assumed predisposing factors in our patients were: hematoma in surgical site in 3 (19%), lymphocele in 1 (6%), and urinary fistula in 2 (12%). Repeated surgeries in the last two items predispose the patient to incisional hernia. The risk of recurrence after repair of incisional hernia without using mesh is more than 50%,<sup>(11)</sup> but after introduction of mesh usage in hernia repair by Usher and colleagues in 1958, the rate of recurrence reduced to 10%.<sup>(5)</sup>

The resultant inflammatory response and connective tissue proliferation conduce to fibrosis formation and a thick scar plate. This can prevent recurrence of hernia.<sup>(2,4,11,12)</sup>

Despite valuable results with propylene mesh, synthetic material can cause infection, migration into bladder or intestine, and damage to the adjacent tissues such as spermatic cord.<sup>(11,13,14)</sup> These complications increase in immunosuppressed patients. One of the important complications in our patients was the serous collection in the site of surgery that subsided after multiple punctures. Hernia recurrence and infection in surgical site were not seen in our series. However, the sample size was small in our study and further studies in large scales are needed.

### Conclusion

One of the surgical complications after kidney transplantation is incisional hernia. It often develops in the first year, especially the first few months after transplantation. This complication is more prevalent in females, patients over 50 years, and overweight ones. Patients with surgical complications such as hematoma, lymphocele, or urinary fistula are also predisposed to incisional hernia. Determining the predisposing factors and considering strict surgical principles, are of great essence. Surgical treatment of incisional hernia with propylene mesh is a safe and effective treatment method.

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