

Prosthetic repair of incisional hernia in kidney transplant patients. A technique with onlay polypropylene mesh

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Abstract: The employment of synthetic mesh for incisional hernia repair in kidney-transplanted patients is rarely reported in the present literature. Many authors believe that mesh employment in such conditions is not safe due to fear of mesh related complications. From 1965 through 1999, a total of 1685 kidney transplants were performed at our Kidney Transplant Unit and 19 patients developed eventrations in the kidney transplant incision, an incidence of 1.1%. From September 1996 eight of these patients had prosthetic repair of the abdominal wall with onlay polypropylene mesh. All patients were under immunosuppressive therapy with prednisone, ciclosporine and azathioprine. Mean age was 48.8 years, mean body mass index was 22.5 and mean number of previous abdominal operations was 2.5. A large polypropylene mesh (Marlex® mesh) was fixed over the aponeurosis after primary closure of the aponeurotic borders, as an onlay graft. There was neither morbidity nor mortality associated to the surgical procedure. No recurrences or long-term complications associated with mesh employment were verified after a follow-up ranging from one year to three years. We concluded that prosthetic repair of incisional hernia in transplanted patients can be performed routinely.

Key words: Incisional hernia – Kidney transplant – Polypropylene mesh

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Received January 04, 2000
Accepted in final form August 17, 2000

The overall incidence of incisional hernia after kidney transplantation is low [Cervelli 1997, Clemente Ramos 1998]. Among the classic predisposing factors, the impairment of wound healing due to post-operative corticosteroid therapy [Priestley 1980] also plays its rule as a possible cause for the development of

incisional hernias in transplanted patients.

Surgery of incisional hernias in immunocompromised patients carries a higher risk of infection and sepsis, a remarkable condition, considering a 16% to 21% incidence of wound infection after elective incisional hernia

repair in normal patients [Houck 1989, Medina 1997].

The high recurrence rate of hernia, after primary repair [Hesselink 1993, Paul 1997, Trupka 1997, Vestweber 1997] and the impairment of wound healing in such patients justify the need for prosthetic repair of incisional hernia. Only

Table 1. Transplanted patients operated for incisional hernia

Patient	Age	BMI	ASA	AO	TS	Discharge	Operation	DS
1	67	20.1	3	2	150	7	9/96	full defect
2	47	18.9	2	3	125	4	10/97	full defect
3	45	20	2	3	74	5	10/97	8 x 6 cm
4	34	24.4	2	1	145	5	10/97	full defect
5	58	23.8	2	5	195	5	5/97	full defect
6	26	18.4	2	1	150	4	5/98	8 x 6 cm
7	51	28.6	2	3	95	5	4/99	full defect
8	62	26.1	2	2	185	4	5/9	10 x 7 cm
mean	48.8	22.5	2.1	2.5	139.9	5.0	-	-
SD	13.9	3.7	0.4	1.3	41.2	0.4	-	-

* Age in years; BMI: body mass index; ASA: American Society of Anesthesiology classification; AO: previous abdominal operations; TS: time of surgery in minutes; discharge in days after surgery; DS: size of the fascial defect; SD: standard deviation

recently, the safety of synthetic mesh has been evaluated in transplanted patients [Clemente Ramos 1988].

In order to establish the standards for the treatment of incisional hernias in such conditions, we reviewed our own experience with prosthetic repair of incisional hernia after kidney transplant.

Patients and methods

From January 1965 through September 1999, a total of 1685 kidney transplants were performed at the Kidney Transplant Unit of the Hospital das Clínicas of University of São Paulo, School of Medicine. During the same period 19 patients were reported to develop an incisional hernia in the kidney transplant incision, an incidence of 1.1%.

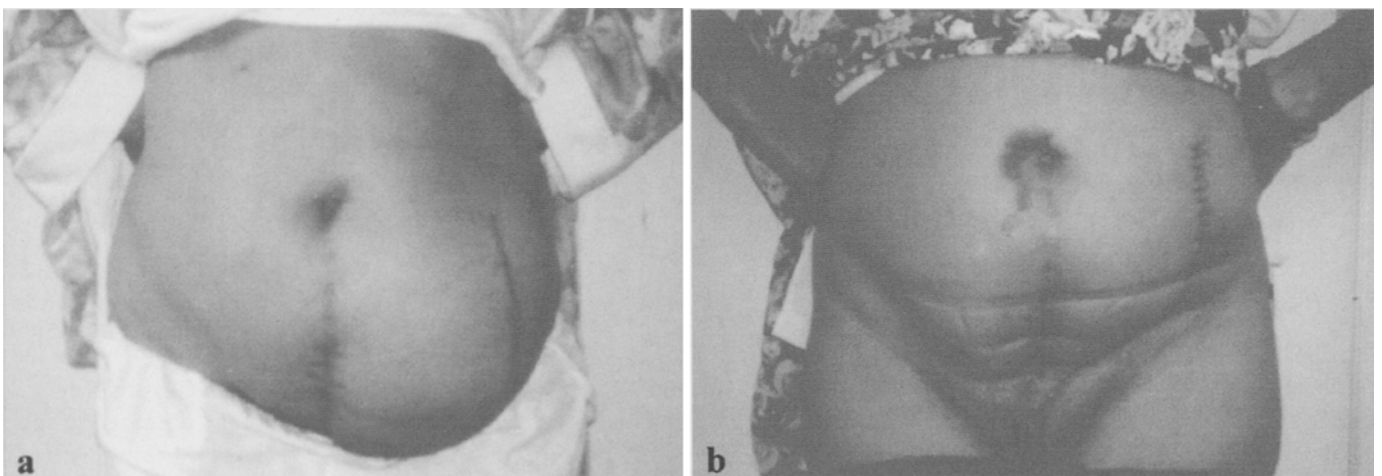
Of the 19 patients, 5 were lost to follow up, 3 were not operated due to poor clinical conditions and 11 were operated from September 1996 through May 1999; eight of them had prosthetic reinforcement of the abdominal wall with onlay polypropylene mesh and were included in this study (Table 1).

There were five male and three female patients. Mean age was 48.8 years, mean body mass index was 22.5 and mean number of previous abdominal operations was 2.5 per patient. All patients had been operated through left external pararectal infraumbilical incisions. Post-transplantation morbidity contributing to herniation occurred in seven patients: early reoperation due to bleeding, evisceration and lymphocele in three patients; lymphocele in three and wound infection in one.

All patients received general anesthesia and in two it was combined with epidural anesthesia. Mean operation time was 140 minutes. Patients received antibiotics for 48 hours starting at operation room; five patients received cef-taxime, two received cef-taxime plus metronidazol or sulfatrimetoprim and one received ceftriaxone.

Patients were under immunosuppressive therapy with prednisone, ciclosporine and azathioprine. One patient had a large recurrent incisional hernia, four had a full-length incision defect and the others had smaller defects; all were easily reducible (Fig. 1a, b).

Surgical approach was done through the previous scar, with identification and resection of the hernial sac, and dissection of adhesions between the omentum and the peritoneum. The perito-

**Fig. 1a, b**

Patient 5. a. Preoperative view. b. Post-operative view

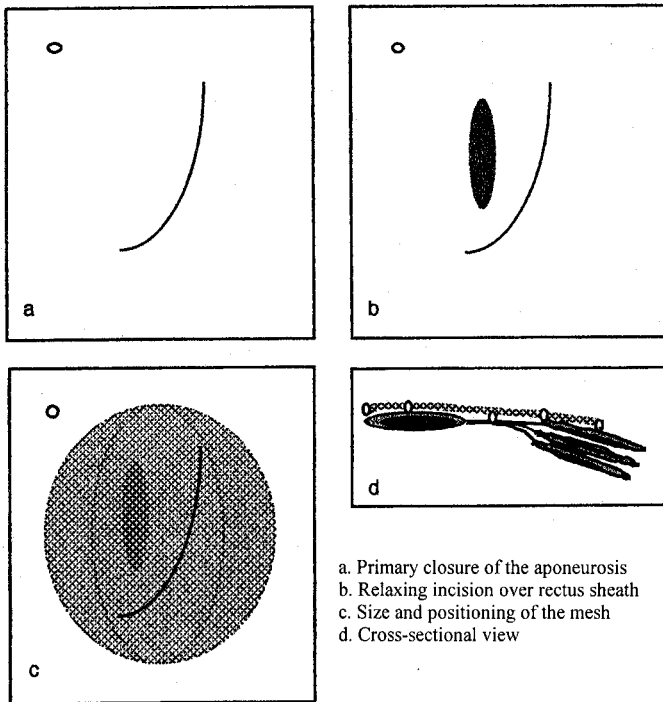


Fig. 2a, b, c, d
Positioning of the mesh

- a. Primary closure of the aponeurosis
b. Relaxing incision over rectus sheath
c. Size and positioning of the mesh
d. Cross-sectional view

neum and the aponeurotic edges were closed primarily with running sutures, restoring the anatomical layers whenever possible. In one patient, relaxing incisions were done along the rectus sheath, to relieve suture tension. An onlay polypropylene mesh (Marlex® mesh, BARD) was employed for reinforcement of the aponeurotic closure.

The mesh was large enough to cover the total length of the aponeurotic suture plus 2 cm on the cranial and caudal borders, and extended for at least 8 cm laterally on each side. It was well fixed over the healthy aponeurosis, as similarly described by Chevrel (1998), with running sutures along the borders and in the middle of the mesh, in order to prevent dead space. Polyglactin sutures were used for aponeurotic closure and mesh fixation. Suction drains were put over the mesh for drainage of the subcutaneous tissue (Fig. 2a, b, c, d). The skin was closed with single stitches of mononylon 4-0.

Soon after surgery, patients were encouraged to stand up and walk. A normal diet was offered to patients in the first post-operative day. Suction drains were removed as soon as the amount of fluids decreased to 50 ml/24 hours.

After hospital discharge, patients were clinically examined after fifteen days, one month, two months and each six months since then.

Results

There was no morbidity or mortality associated to the surgical procedure. All patients had an uneventful immediate post-operative course.

Mean post-operative discharge was 5 days, ranging from 4 to 7 days.

No recurrences or long-term complications associated with mesh employment, were seen after a follow-up ranging from one to three years. One patient developed a left inguinal hernia after two years follow-up, and was submitted to a Lichtenstein repair.

Discussion

Incisional hernias occur in 2 to 11% of elective operations [Bucknall 1982, Ellis 1983, Mudge 1985, Lamont 1988, Santora 1993, Carlson 1995, Gislason 1995, Otchy 1995]. Common causes are infection, obesity and reoperations [Lamont 1988, Gislason 1995, Sugarman 1996, Israelson 1997]. In this series there was no overweight associated to hernia genesis.

Early reoperations through the transplant incision might have contributed in 3 patients, which presented complications such as hemorrhage, lymphocele and evisceration, immediately after the transplant.

Recurrence of incisional hernias occurs in up to 50% after primary closure [Langer 1985, Mudge 1985, George 1986, Lamont 1988, Hesselink 1993, Paul 1997, Trupka 1997, Vestweber 1997], and in 3 to 17% after prosthetic reinforcement of the abdominal wall [Usher 1962, Stoppa 1987, Colombo 1992, Liakakos 1994, Dibello 1996, McLanahan 1997, Trupka 1997, Leber 1998]. Therefore, the best results for complex ventral hernia repair are accomplished when synthetic mesh is employed [Bendavid 1992, Santora 1993, Amid 1994b, Kennedy 1994, McLanahan 1997].

The fear of complications associated with mesh, such as chronic sinuses, colo-cutaneous fistula and mesh extrusion [Mathes 1975, Boyd 1977, Kaufman 1981, Stone 1981, Voyles 1981, Waldrep 1993, Deguzman 1995, Seelig 1995, Temudom 1996, Leber 1998] were common in the past and nowadays still prevent the liberal use of mesh in elective operations [Usher 1961, Moore 1968, Lázaro da Silva 1979, Thomas III 1993].

The development of new prosthetic material and a better understanding of mesh incorporation in host tissues made clear that those unfavorable results were consequences of inadequate mesh application [White 1988, Amid 1994a, Amid 1996, Amid 1997, Morris-Stiff 1998]. Nowadays it is unquestionable that an immense improvement of results in hernia surgery was obtained with the employment of mesh. But the application of mesh in some issues remains unclear, such as its use in immunocompromised patients.

The incidence of incisional hernia after kidney transplant ranges from 0,74% to 1,2% [Cervelli 1997, Clemente Ramos 1998]. Although rare, those hernias are sometimes misinterpreted as a weakened abdominal wall due to iatrogenic injury to the abdominal nerves; the surgical exploration must be meticulous, since the external muscle layers may be intact, while the hernial sac is

located between the deeper layers of the abdominal muscles.

Sometimes the sac may be large enough to simulate an associated inguinal hernia when it extends down to the scrotum. The sac must be completely dissected and opened in order to free the adhesions with the omentum and the intestines. It is possible to perform a biopsy of the kidney at this time, although it can be performed lately through the mesh. The borders of the defect are almost always easily approached allowing the primary suture of both sides of the aponeurosis, with anatomic reconstruction of the wall in more than one layer. Rarely it may be necessary to perform relaxing incisions along the rectus abdominis aponeurosis, in order to allow a tensionless suture.

Employment of mesh has been reported by Cervelli [1997], in an obese transplanted female, with a large incisional hernia that was treated with an onlay Prolene graft and abdominoplasty. Evolution was unremarkable and the patient was discharged on the 12th PO.

A recent publication by Clemente Ramos [1998] confirmed our results. In

eight transplanted patients with incisional hernia, a preperitoneal polypropylene mesh (Prolene®) was used to repair the abdominal wall defects. Two patients developed complications (one hematoma and one wound infection) but mesh removal was not necessary in any case and there were no recurrences after a follow up of 33 months.

In our point of view, the mesh must be fixed over the aponeurosis as an onlay graft, anatomically reinforcing the abdominal wall. Preperitoneal repair turns very difficult another surgical approach to the transplanted kidney and is better employed to treat inguinal hernias, as the intra-abdominal pressure pushes the peritoneum against the mesh and the mesh against the bony structures of the pelvis, rendering the peritoneum inelastic. Running sutures of polyglactin are applied along the borders and in the middle of the mesh and along the relaxing incisions. It is not advisable to leave dead space between the mesh and the patient tissues since this may prevent the total incorporation of the mesh; single stitches may be applied to eliminate dead space. The size of the

mesh must be large enough to cover the total length of the aponeurotic suture plus 2 cm on the cranial and caudal borders, and it must extend for at least 8 cm laterally on each side. A suction drain is routinely disposed over the mesh and removed around the fourth day. Despite the large incidence of seromas associated with onlay mesh, no seromas were observed in this series.

Prophylactic antibiotics were routinely employed and we prefer 3rd generation cephalosporins, such as ceftaxime. Immunosuppressive drugs can be administered as usual.

Conclusion

Although this is a small series, the results are meaningful, since no early or late post-operative morbidity was associated with polypropylene mesh employment for incisional herniorrhaphy in kidney transplant patients.

Our results show that immunosuppressive therapy is not a contra-indication for the surgical repair of incisional hernia with synthetic mesh in transplanted patients.

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