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Testicular Complications Following Renal Transplantation

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THE PROCEDURE first described by Küss [4] has become standard technic when a kidney homograft is placed extraperitoneally in the iliac fossa through an inguinal incision.[6,10] In most transplantation centers the spermatic cord is divided routinely to facilitate exposure of the iliac vessels and urinary bladder. The prospects for a long postoperative life were so remote in the early years of renal transplantation that considerations of the morbidity from such details of the procedure were given little attention. This attitude can no longer be justified, now that long-term survival can be expected in the great majority of patients.

The development of a hydrocele or testicular atrophy has often been observed on the side of the transplant operation at the University of Colorado and Denver Veterans Administration Hospital. The present study was undertaken to determine the frequency of these and other complications pursuant to division of the spermatic cord and to assess whether division of this structure should still be recommended.

Methods

Ninety male recipients of 98 renal homografts who were 3½ to 54 years old at the time of transplantation, were interviewed and examined by at least two observers from one to 8½ years post-transplantation (mean 3.2 years ± 2.1 SD). Since bilateral inguinal operations were performed in eight patients, there were 98 testes at risk. Four patients with preoperative testicular lesions consisting of atrophy (three cases) or atrophy on one side and a hydrocele on the other (one case) secondary to mumps or herniorrhaphy, however, were excluded, leaving 86 patients and 94 operative sites for analysis. In addition, 15 female renal recipients who underwent 20 inguinal operations were similarly studied one to 7½ years (3.2 ± 1.7 SD) postoperatively, for evidence of complications after division of the round ligament of the uterus. The male and female patients were selected only by their appearance in the outpatient clinics for routine follow-up.

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Results

Females

No lesions were found in the inguinal canal or the labium majus of the operated side(s).

Males

Of the 94 testes at risk 70 developed lesions in the postoperative period (74.5%) (Table 1). In addition, there was atrophy of the testis on the non-operated side in seven instances. In the majority of cases the lesions were asymptomatic and were discovered after closely questioning the patient or on examination of the scrotal contents.

Sixty-two of the 86 patients developed post-transplantation hydroceles, in one instance they occurred bilaterally following transplantation. The complication thus occurred in 67.0 per cent of the testes at risk (Table 1). Fifty-three of the hydroceles were of small or medium size and caused few or no symptoms, 10

TABLE 1. *Incidence of Testicular Lesions Following Spermatic Cord Division at Renal Transplantation. Eight Patients had Bilateral Operations*

Total Patients	86	
Total Testes at Risk	94	
Hydrocele	63*	(67%)
Atrophy	13**	(13.8%)
Acute Necrosis	1	(1.1%)
Recurrent Pain	2	(2.1%)
Total Testes With Postoperative Lesions	70	(74.5%)
Atrophy on the Non-operated Side	7***	

* Bilateral in one patient who had operations on both sides
** In seven instances in association with hydrocele
*** In 2 patients in association with atrophy on the operated side

were large (greater than 10 × 5 cm.) and symptomatic. The hydroceles appeared as early as 3 weeks after transplantation. They tended to persist indefinitely although an occasional patient stated that the swellings had decreased in size over a period of several months or years.

Hydrocelectomy was performed in seven patients. One of the testes was found to be atrophic at operation and was removed. In another, the scrotal contents became infected following operation and orchiectomy became necessary.

Eighteen of the 86 patients had testicular atrophy. In 11 instances the lesion was on the side of the transplantation, in five it was contralateral and in two, bilateral (Table 1). In six cases the atrophy occurred in association with a hydrocele and in one it appeared after hydrocelectomy. Of the 11 patients with atrophy only on the side of transplantation, three gave a history of a painful swelling of the testis which appeared soon after transplantation and was followed by shrinkage. One of the two patients with bilateral atrophic testes underwent both left and right sided inguinal incisions for transplantation. Postoperative atrophy, therefore, occurred in 13 of 94 testes (13.8%) (Table 1). There was no obvious explanation for the lesions in the patients who had atrophy of the contralateral testes.

In one patient the testis underwent acute necrosis in the early postoperative period. The organ was removed 7 days after the original operation. In addition, two patients had recurrent pain in the testis on the side of transplantation, but at no time were these attacks severe.

Discussion

In most cases, the testicular complications after transplantation were asymptomatic and were discovered by questioning the patient or by examination of the scrotal contents. Hydrocele formation was by far the most common notation, presumably because of the division of lymphatic drainage directly from the intrascrotal structures. In addition, other more distant lymphatic channels such as those along the iliac vessels were routinely interrupted. The development of hydroceles under these circumstances is not surprising in view of the evidence published by Lascelles and Annis,[5] Rinker and Allen,[8] and Wallace [11] that hydroceles are usually caused by a defect in the lymphatic absorption of the fluid secreted in the tunica vaginalis.

Similarly, the explanation for testicular atrophy is on anatomical grounds. Division of the cord results in interruption of the testicular artery and other vessels supplying the testis but atrophy occurs only in those patients in whom the collateral circulation is inadequate for the nutrition of the organ.[2,3,7] However, atrophy was not always related only to the division of the spermatic cord as shown by the cases in which it occurred on the non-operative side. One possibility is that the pre-existing uremia may have been at least partly responsible as has been suggested by Freeman and Schmitt and their associates.[1,9]

The fact that 70 of the 94 testes to which the cord had been divided developed some obvious lesion makes it clear that technical modification of the transplantation procedure is in order. For the past several years, we have avoided the step of spermatic cord division in selected instances and in the past several months, we have virtually eliminated it. Separation of the cord attachments at the internal inguinal ring permits easy medial displacement of this structure with relatively little impairment of exposure of the iliac vessels and the recipient ureter or urinary bladder. When the incision is closed the divided portion of fascia and the internal inguinal ring can be easily repaired.

Summary

Eighty-six male patients underwent 94 renal homotransplantations through inguinal incisions, with concomitant division of the ipsilateral spermatic cords for facilitation of exposure. After follow-ups of 1 to 8½ years, hydroceles, atrophy, acute necrosis or recurrent pain occurred in 74.5 per cent of testes. Although many of the lesions were asymptomatic and the patients were unaware of their existence, there was enough morbidity to disqualify routine division of the spermatic cord during renal transplantation.

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