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BACK TO INGUINAL VARICOCELECTOMY

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Background : *Varicocele is the most common surgically treatable cause of male sub fertility. The underlying pathophysiology is unclear. Surgical ligation (varicocelectomy) is the conventional management.*
Methods*: in the period from October 2000 to May 2002 we operated upon 300 patients with varicocele came to be treated from sub fertility. We used the inguinal approach in all patients. We added a new step n the operative technique, which is evacuation of the engorged distal venous stump prior to its ligation in half of the patients and tested its effectiveness in relieving the postoperative discomfort and hydrocele formation, which are the most common postoperative sequences. We aimed at exploration of the great advantages of this elderly described approach and its suitability for mostly all cases of varicocele and all types of patients and to discover the effects of ligating the internal spermatic artery at this level. We evaluated the patients postoperatively as regard the hospital stay, the postoperative course, the postoperative complications, the degree of improvement of the sperm parameters and the incidence of recurrence.*
Results: *The mean operative time was 30 (20 to 55) minutes. Postoperative course was surprisingly quiescent in the patients in whom the testes were evacuated from the engorged blood before ligation of the veins and this is in contrary with the postoperative testicular heaviness that was experienced in all patients in whom ligation was done without evacuation. Small sized lax hydrocele occurred in 30 cases (10%). Hydrocele maintained in only 10 cases (3.3%). A total of 175 patients showed improvement in their sperm count after 6 months (58.4%). Recurrence of the varicocele was recorded in a total of 20 cases (6.9%) after 9-13 months.*
Conclusions: *Inguinal approach is the best approach to deal with varicocele. It carries a lot of advantages. Evacuation of the distal venous stump is a very important step in minimizing the postoperative patient's discomfort.*

Key words: Varicocele, sub fertility, varicocelectomy, inguinal approach.

INTRODUCTION

Varicocele (dilatation of the pampiniform venous plexus) is found in 10 to 15% of the male population and they occur predominantly on the left side. The etiology may be a longer left spermatic vein with its right-angle insertion into the left renal vein and/or absence of valves, which results in higher hydrostatic pressure in the left spermatic vein causing dilatation. Also, the left renal vein may be compressed between the superior mesenteric artery and the aorta. This "nutcracker phenomenon" may result in elevated pressure in the left testicular venous system [(1)].

Varicocele is accepted as a common cause of male sub fertility, even though many men with varicocele appear to have normal fertility[(2)] . Moreover, the incidence of varicocele in men with impaired fertility is about 30%. Varicocele is the most common surgically correctable cause of male infertility[(3)].

The pathophysiology of the varicocele effect on fertility remains unclear, but the association of varicocele with decreased testicular size, abnormal testicular histology and abnormal semen parameters is clearly established[(4)].

Abnormal semen parameters should be demonstrated in sub fertile males with varicocele prior to advising varicocelectomy. Decreased sperm motility or a "stress pattern" in the semen should be documented; however a decreased sperm count may or may not be present.

Varicocele management includes surgical (traditional or laparoscopic) or conservative techniques (sclerotherapy) [5]. Surgical ligation (varicocelectomy) is the conventional approach in managing varicocele. However, Percutaneous embolization by means of balloon or metallic coil has been shown to be a useful alternative but still not widely accepted [6].

AIM OF THE STUDY

The aim of this study is to evaluate the great advantages of the inguinal approach in dealing with varicocele, so switching mind back to the easy, practical and most valuable approach for varicocelectomy.

PATIENTS AND METHODS

In the period from October 2000 to May 2002, three hundred male patients were diagnosed and operated upon for sub-fertility by inguinal varicocelectomy. Our patients were 26 to 59 years old (average of 36.6). Two hundred and fifty (83.3%) of them were complaining of primary infertility while 50 patients (16.7%) were of the secondary type.

They were examined carefully and graded as: (i) grade 1 (small) – palpable only during a valsalva maneuver (90 patients), (ii) grade 2 (moderate) – palpable without the need of the Valsalva maneuver (170 patients), and (iii) grade 3 (large)—visible (40 patients). The testes were examined carefully and measured by orchidometer and testes less than 20 mm were considered atrophic and were excluded.

All patients had at least 3 consecutive semen examinations before deciding surgery. Three parameters were considered, the sperm count, sperm motility and abnormal forms. We used the Doppler stethoscope in all cases as a routine examination.

The indication for operation was male partner infertility in the presence of clinical varicocele (I to III grades) that is proved by the Doppler in all cases.

Two hundred and eighty varicoceles were left sided (93.3%), one was right sided (03%), while 19 were bilateral (6.4%) with predominant left side. So all patients except one were operated upon by left-sided varicocelectomy. Those with bilateral varicocele were either missed for follow-up or their parteners got pregnant after unilateral maneuver so they were not subjected to contralateral operation.

Sixty cases (20%) were operated upon for oligospermia only, 200 cases (66.7%) were operated upon for hypomotility with oligospermia and increased abnormal forms (more than 50%) and forty cases (13.3%) for hypomotility only. No cases were operated upon for increased abnormal forms only, (Table 1).

Anesthesia was spinal in the majority (280 cases, 93.3%), local in 5 cases (17%) and general in 15 cases (5%).

All patients, except one (has a single right sided testis) were operated upon by left sided inguinal varicocelectomy. The operations were done on the basic principles described by Ivanissevich[7]. We did evacuation of the engorged blood in the testes through the distal end of the transected veins before its ligation aiming at minimizing the postoperative testicular heaviness in half of our patients (150 patients).

The operation was done by the naked eye in all cases (no magnification was used), all operations were done though a small transverse inguinal incision (2-3 cm).

The testicular artery was preserved in 100 cases (33.3%) and sacrificed in the rest either due to inadvertent injury or small spastic inseparable artery.

All veins identified were sacrificed, both internal and external spermatic plexus. Vessels of the vas were sacrificed in 125 cases (41.7 %) due to apparently dilated vassal vein.

All operations were done on a day case basis; all patients were discharged within 24 hours, returned for examination and removal of stitches after 6 days.

Follow up was done to assess the improvement in semen characters (laboratory success), persistent or recurrent varicocele (operative success) and presence of hydrocele or testicular atrophy (operative complications).

Follow up was executed by physical examination, orchidometer, Doppler and semen analysis that began after 16 weeks and then every month. The improvement was judged by the semen parameters and the occurrence of conception.

RESULTS

The mean operative time was 30 (20 to 55) minutes. Postoperative course was quiescent in the patients in whom the testes were evacuated from the engorged blood before ligation of the veins and this is in contrary with the postoperative testicular heaviness that was experienced in all patients in whom ligation was done without evacuation. Testicular heaviness in those patients was recorded to be felt up to 4 weeks postoperatively. Pain was mild in all cases. One dose of intramuscular sodium diclofenac was given 2 hours after the operation and there was no need for more doses. Single dose of intravenous first generation cephalosporin was given routinely intra-operatively.

Postoperative complications were confined to small sized lax hydrocele in 30 cases (10%) and superficial wound sepsis in 10 cases (3.3%). Hydrocele was observed and on follow-up, 20 cases (6.7%) was found to disappear spontaneously and was maintained in the 10 other cases (3.3%). Only one patient had a tense large hydrocele that indicated surgical intervention. Wound sepsis was treated by daily dressings and resolved within one week. Testicular atrophy was not recorded in our series. No cases with persistent varicocele were recorded, (Table 2).

Recurrence of the varicocele was recorded in a total of 20 cases (6.9%) after 9-13 months, they were 16 of the artery preserving group (16%) and 4 of the sacrificed artery group (2%), (Table 3).

Follow-up semen analysis began after 16 weeks postoperatively and it was done monthly. By the first follow-up semen examination (after 16 weeks), 50 patients showed improvement in their sperm count (16.7%), after 6 months a total of 175 patients showed improvement in their sperm count (58.4%). Ten patients showed reduction in their sperm count when examined after 9 months (3.3%) while another 5 patients had reduction in their sperm count after initial improvement (1.7%). One hundred patients showed no changes in their sperm count (33.3%). Ten patients were lost for follow up (3.3%). (Table 4).

One hundred and ninety patients showed improvement in their sperm motility (79.2%), while 80 patients showed decrease in the abnormal forms (40%). The incidence of conception was 35% after one year.

Table (1): ***Preoperative results of semen analysis***

Preoperative Semen examination	*No*	*%*
Oligospermia + hypomotility	200	66.7
Oligospermia only	60	20
Hypo motility only	40	13.3

Table (2): ***Postoperative complications***

Postoperative complication	*No*	*%*
Hydrocele	30	10
Wound infection	10	3.3
Testicular atrophy	0	0
Recurrent varicocele	20	6.7

Table (3): ***Correlation between testicular artery ligation with recurrence of varicocele***

Testicular artery	*No*	*%*	*Recurrence*
Preserved testicular artery	100	33.3	16 (16%)
Sacrificed testicular artery	200	66.6s	4 (2 %)

Table (4): ***Effect of the varicocelectomy on sperm count***

Sperm count	*No*	*%*
Improved	175	58.4
Decreased	10	3.3
Decreased after initial improvement	5	1.7
No change	100	33.3
Lost for follow up	10	3.3

DISCUSSION

The goal of varicocelectomy in the adolescent is to improve the patient's potential for future fertility. While there is no consensus on which operative approach is best suited for adolescent with varicocele, it is imperative to weight the advantages and disadvantages of a given therapeutic method before adopting its use [8].

Early study reported the incidence of post varicoclectomy hydrocele to be as much as 39% after high inguinal ligation (at he level of internal ring)[2] while more recent studies recorded it to vary from 3.1 to 13% with the higher ligation tending to cause more hydrocele[9,10]. Misseri et al., reported post-varicocelectomy in 28% of cases after Palomo retroperitoneal ligation and in 14% after inginal varicocelectomy[8].

In our study, we observed postoperative hydrocele in 6.7% (30 cases) of the patients but surprisingly, the hydrocele was resorbed to a great extent (not completely) in 20 of them while it was maintained in 10. only one patient had a tense hydrocele that necessitated surgical intervention. These results seem to be related to the preservation of the cord coverings and lymphatics nearby the internal spermatic artery as hydrocele is mostly attributed to disruption of lymphatic drainage of the tunica vaginalis with en block ligation of the internal spermatic vessels.

From the above results in addition to our results, it seems that inginal approach is accompanied by a lower incidence of postoperative hydrocele, which can be further minimized by avoiding en block ligation of the internal spermatic vessels and preservation of the cremasteric coverings of the cord.

The increased testicular temperature not only affects spermatogenesis but it may affect epididymal function, which is important for sperm maturation and motility. Correction of varicocele may dually improve testicular and epididymal functions and therefore spermatogenesis in quantity and quality[11].

Madgar et al. reported 1-year pregnancy rate of 60% in the varicocelectomy group while it was 10% in non-operated group [12]. While Perimenis et al. reported 1-year pregnancy rate of 46.6% in the varicocelectomized group while it was 12.9% in the medically treated group[11]. This is correlated with our results , as we recorded a 1-year conception rate of 35% after inguinal varicocelectomy. But we suppose that this incidence can be higher after a longer period of follow up and if we consider a consequent contralateral varicocelectomy in the patients with bilateral varicocele.

As regard the semen parameters, we reported improvement in the sperm count in 58.4% of our patients and increased in sperm motility in 79.2% while the decrease in the abnormal forms was recorded in 40% of patients considering that, not all the patients had an increased number of abnormal forms (only 200 cases). In other studies semen parameter improvement was recorded in 83.2%, this percentage expresses an improvement of at least 50% in the main semen parameter, for which patients entered the study[11].

We reported recurrence in 6.9% of the patients after inguinal varicocelectomy after 1 year. In the cases where we preserved the internal spermatic artery (100 cases) we detected recurrence in 16%, while in the other group where we sacrificed the internal spermatic artery (200 cases) the recurrence rate was 2%. Trial to preserve the artery is usually accompanied with lost veins that cause recurrence later. Kattan reported recurrence in 39% of the cases with preserved artery, while it was 5.9% when the internal spermatic artery was sacrificed[13]. When we combine this low recurrence rate with the 0% occurrence of testicular atrophy in our series we can conclude that ligation of the internal spermatic artery is safe and even recommended in the inguinal varicocelectomy to minimize recurrence.

CONCLUSION

From this study we can conclude that inguinal approach is the best approach to deal with varicocele as it carries the following advantages:

1. Easy, practical and needs no sophisticated experience.
2. Allow dealing with all veins in the cord, so minimizes the incidence of recurrence.
3. Can be done under any type of anesthesia (general, regional, local)
4. Offers a very smooth postoperative course with a good cosmetic outcome as the wound is carried out in the lower abdominal crease.
5. It is usually done on a day case basis, so optimizes the cost benefit ratio.
6. Minimal postoperative complications.

We recommend evacuation of the engorged testes before ligation of the distal stump of the veins as a routine step.

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