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Outpatient varicocelectomy performed under local anesthesia

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Abstract

Aim: To report a series of varicocelectomy performed under pure local anesthesia. **Methods:** From July 1988 to June 2003, a total of 575 patients, aged between 15 and 73 years, underwent high ligation of the internal spermatic vein for treatment of a varicocele testis under a regional block in which a precise injection of 0.8 % lidocaine solution was delivered to involved tissues after exact anatomical references were made. A 100-mm visual analog scale (VAS) was used to assess whether the pain level was acceptable. **Results:** The surgeries were bilateral in 52 cases, and unilateral in 523 cases. All were successfully performed on an outpatient basis except in the case of two patients, who were hospitalized because their surgeries required general anesthesia. Overall, 98.6 % (567/575) of men could go back to work by the end of the first post-operative week and only 8 (1.4 %) men reported feeling physical discomfort on the eighth day. The VAS scores varied from 11 mm to 41 mm with an average of (18.5 ± 11.3) mm that was regarded as tolerable. **Conclusion:** This study has shown varicocelectomy under local anesthesia to be possible, simple, effective, reliable and reproducible, and a safe method with minimal complications. It offers the advantages of more privacy, lower morbidity, with no notable adverse effects resulting from anesthesia, and a more rapid return to regular physical activity with minor complications. *(Asian J Androl 2005 Dec; 7: 439–444)*

Keywords: anterior superior iliac spine; spermatic cord; aponeurosis; umbilicus; pubic symphysis; varicocelectomy; anesthesia

1 Introduction

Varicocelectomy is a well-accepted and well-described procedure [1], and its indications [2, 3] and methodology [4, 5] have long been established. The most common anesthetic method for high ligation of the internal spermatic vein (ISV) is general or spinal anesthesia [6]. Although local anesthesia with an adjuvant intravenous injection of sedatives has been reported [7], in this report we introduced a regional blockage technique using only local anesthetics for varicocelectomy on an outpatient basis, developed after repeated cadaveric studies and past clinical applications.

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2 Meterials and methods

2.1 Patient population

From July 1988 to June 2003, a total of 575 patients,

aged between 15 and 73 years, underwent high ligation of the ISV for treatment of varicocele testis. Their complaints included 285 patients with testicular discomfort, 191 with infertility, 62 with a palpable mass and 37 with testicular dragging sensation. Scrotal ultrasonography was used to confirm varicocele in all cases. All procedures were performed under a regional block for which an exact anatomical reference was made.

2.2 Anesthesia

Using a marker pen, an isosceles triangle (Figure 1 Left) was drawn between the anterior superior iliac spine (A), umbilicus (B), and mid-penopubic fold symphysis pubis (C). The point on the skin, one fingerbreadth perpendicular to the mid-point of A and C, corresponded to the underlying spermatic cord. A 23-gauge, 3.18-cm disposable needle connected to a 10-mL syringe was used to inject the local anesthetic, which was prepared as follows: 50 mL of 0.8 % lidocaine solution in an aseptic bowl that was pre-filled with 0.1 mL of a 1 : 200 000 epinephrine solution [8, 9]. Initially, the injection was given superficially, relative to the aponeurosis of the external oblique muscle (Figure 1 Right). Subsequent injections were given into a deeper layer whenever necessary. The total lidocaine consumption ranged from 120 mg to 320 mg (15 mL–40 mL), with an average of (177.6 ± 16.8) mg.

2.3 Surgical procedure

The intersection (Figure 1) of the transverse abdominal crease and the lateral margin of the rectus abdominis muscle were marked. This position corresponded to the underlying spermatic cord. When determining the point using palpation, it was very helpful to have the patient contract the muscles of the lower abdomen. A rectangular region of approximately 5 cm × 1 cm, centered at the point, was infiltrated with 5 mL–7 mL of lidocaine solution using a 10-mL syringe. A 3.5-cm wound was made after the anesthetic effect was ascertained by pinching the skin with toothed forceps. The circumflex branch of the external pudendal vein was preserved if encoun-

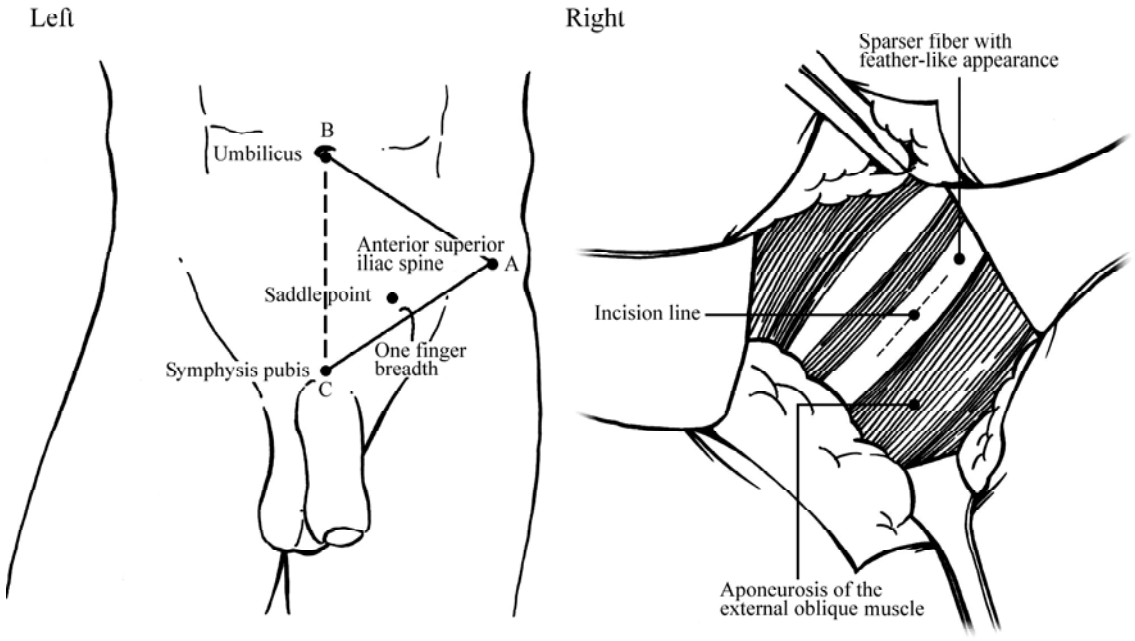

Figure 1. Schematic illustration of the anatomical landmarks for high ligation of the internal spermatic vein. Left: Using a marker, an isosceles triangle was drawn between the anterior superior iliac spine (A), umbilicus (B) and symphysis pubis (C). The point on the skin, one fingerbreadth perpendicular to the mid-point of A and C, corresponds to the underlying spermatic cord. This saddle point is the intersection of the transverse abdominal crease and the lateral margin of the rectus abdominis muscle. It is also the depression point along the crease between the three abdominal muscles: the external oblique, the internal oblique and the transversus abdominis muscles. Right: A 3-cm wound centered on the above point was made after topical infiltration by way of an injection of a lidocaine solution using a 10-mL syringe, which is easily handled. The anesthetic effect was confirmed by pinching the skin with toothed forceps. The wound was dissected and continuously deepened until the aponeurosis of the external oblique muscle was encountered. A slit wound was made in the aponeurosis extending to both ends using scissors.

tered. The wound was deepened to Scarpa's fascia, which was opened, using hemostats, after the area was anesthetized. The aponeurosis of the external oblique muscle was clearly identified, and local infiltration, with the injection needle beneath the fascia, was performed. A feather-like appearance of the lateral portion of the aponeurosis denotes the exact position, and a slit wound (Figure 1Right) was made in the direction of its fibers with a surgical scalpel, followed by an extension on both ends using a pair of scissors. The cut margin was held by hemostat in order to apply a US Army retractor to expose the underlying muscle. Fatty tissue positioned caudally with a yellowish appearance (Figure 2A, A'), delineated by muscle tissue located cranially with a reddish color, could be well identified. A rectangular area of approximately 3 cm × 1 cm on the muscle, located 0.5 cm cranial to the above delineation, was infiltrated with 4 mL–5 mL of lidocaine solution, and care was taken not to puncture into more deeply seated vessels. Therefore, aspiration by syringe was required before attempting any injection. The muscle layer was gently separated with a pair of retractors through the external oblique, the internal oblique and the transversus abdominis muscles until the whitish paravesical fat was encountered.

The spermatic cord (Figure 2B, B'), with its accompanying vas deference, was hooked and pulled out cranially to the internal ring of the inguinal canal with right angle hemostats (Figure 2C, C'). The cord could occasionally be pulled laterally if the blade of the retractor was positioned too deeply. If the retractor is withdrawn, the inferior epigastric artery and vein can be clearly seen and the superficial-lateral neighboring cord can be easily managed. A deeper-blade retractor may be applied cranially which limits the abdominal content and enables the cord to be clearly identified. When managing the cord, it is unnecessary and unwise to separate any tissue to avoid causing any pain to the patient. The entire cord was hung out with cured-prong hemostats. Three to four veins were meticulously dissected and identified in this process. A loupe (Designs for Vision, Ronkonkoma, NY, USA) was routinely applied during this procedure. A squeezing maneuver was applied to the pampiniform plexus to facilitate visibility of the vein whenever necessary. The transparent lymphatic vessel and a pulsatile, more pinkish in color or rather erect artery could be readily identified. In the management of larger veins, a 3-cm segment was removed, and the proximal stump was tied 0.5 cm proximally from its end. The distal stump

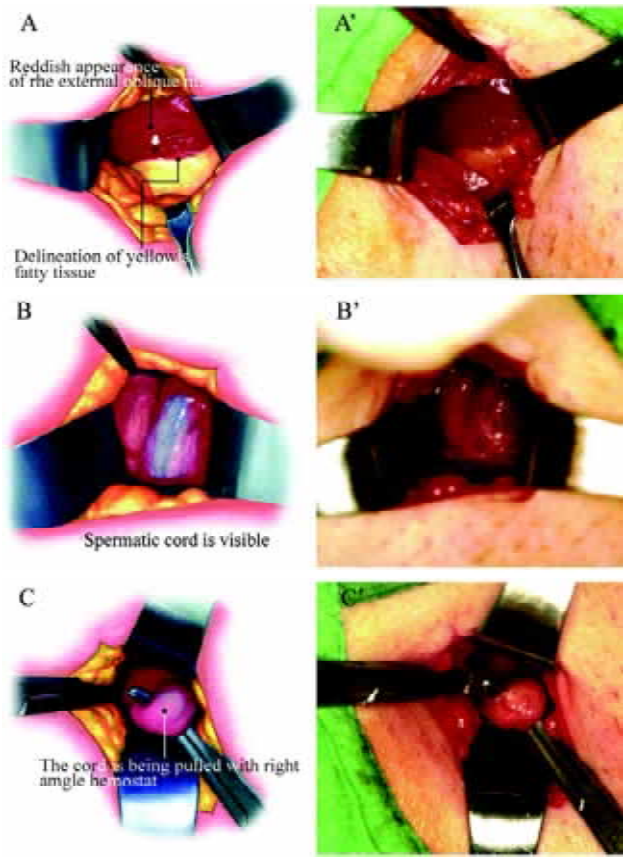

Figure 2. Operation on the spermatic cord above the internal ring. The schematic illustrations are arranged on the left, with photographs positioned on the right. (A) and (A'): Two retractors were used to pull the aponeurosis away in order to expose its underlying muscle. The external oblique muscle cranially and the whitish fatty tissue caudally could clearly be delineated. Likewise, the muscle was infiltrated and bluntly separated using hemostats until the paravesical fat was seen. (B) and (B'): The spermatic cord with its vas deference was identified. The retractor was carefully advanced, otherwise the inferior epigastric vessels that lie medially and inferiorly would be exposed. (C) and (C'): A right angle retractor was used to hook the cord proximal to the internal ring of the inguinal canal. Subsequently, the cord was hooked by cured-prong hemostats and was then ready for further management.

was allowed to remain open for drainage of the blood pooled in the pampiniform plexus and was freely tied afterwards. Finally, the two stumps were tied together with two knots separated by at least 0.2 cm. This reinforces the strength of the entire spermatic cord as well as preventing the veins from being re-canalized postoperatively. The muscle layer was approximated, using 3-0 or 4-0 silk sutures with adequate tightness after the cord was returned to its normal position. Likewise, the

aponeurosis, Scarpa's fascia, and the subcutaneous layer were subsequently closed layer by layer with 4-0 silk. Finally, the skin layer was repaired with 4-0 or 6-0 nylon sutures.

2.4 Follow-up

Oral acetaminophen, 500 mg four times per day, was prescribed for 5 days, and diclofenac 50 mg was taken once or twice daily, depending on the patients' perception of pain. Patients were instructed to apply a clenched fist to compress the wound whenever they sneezed or coughed. Physical daily activity, however, was not limited.

The pain level was assessed with a 100-mm visual analog scale (VAS) at 2 h, 4 h, 8 h, 12 h and 24 h post-surgery. Scrotal ultrasonography was again used to confirm residual varicocele if suspected clinically.

3 Results

The procedure was performed on an outpatient basis on 575 patients whose surgeries were bilateral in 52 cases and unilateral in 523 cases. Two patients were hospitalized because their obesity and anxiety required general anesthesia. Their operation had been attempted on an outpatient basis without success. However, their operative courses were uneventful and resulted in a 30 % increase to their medical expenditure. One patient sustained a stitch abscess which was cured after a skin revision was performed.

The VAS scores varied from 11 mm to 41 mm with an average of (18.5 ± 11.3) mm. Subsequently, 98.6 % (567/575) of the patients could go back to work by the end of the first postoperative week. The numbers of patients who returned to work on postoperative day 1, 2, 3, 4, 5, 6 and 7 were 173 (30.1 %), 191 (33.2 %), 83 (14.4 %), 48 (8.3 %), 41 (7.1 %), 23 (4.0 %) and 8 (1.4 %), respectively. Only 8 (1.4 %) men reported feeling physical discomfort on the day 8. Of the 575 patients, 569 (99.0 %) regarded this treatment modality as a worthy one. Although 6 (1.0 %) men complained of symptomatic indifference, only 4 (0.7 %), in fact, had a confirmed postoperative recurrence after evaluation with scrotal ultrasonography.

4 Discussion

The surface markings of the lower abdomen and the inguinal region have been previously described in anatomical texts, which were exclusively derived from human cadavers [10]. In the surgeon's practice, however, an attempt to directly apply that anatomical knowledge may not be practical until a proper recognition of these viable tissue markings is given. During the entire procedure described in our study, neither a Bovie nor a suction apparatus was applied on any patients, as no excessive blood was noted. All vessel stumps could be readily identified and ligated with a 6-0 nylon suture. Likewise, a drain tube was not routinely necessary because vessel trauma could be avoided. Of the 575 patients undergoing the operation, 11 were chronically ingesting aspirin for coronary artery disease, and two patients were taking Coumadin daily because of their valvular replacement. They all underwent this surgery after discontinuation of their medication had been requested 5 days preoperatively, and they required no special efforts or care after the operation.

An injection may be expected to be painful in this sensitive region. In reality, however, a slow injection as well as a quick puncture through the skin was acceptable [11] to almost all the patients. A wheal produced as a result of a subcutaneous injection should be avoided to prevent any further pain or anxiety to the patient. Some investigators advise against the use of adrenaline as a local anesthetic [12] because of ischemia, but this concern was not applicable to any of the patients in our study because there were none with actual ischemia. We found that this agent was not only good for prolonging the anesthesia time [13], but may also be helpful to a physician in managing a type of challenging surgery [8, 9].

When the spermatic cord is ready to be operated on, it is positioned immediately above the internal ring of the inguinal canal, where there is a 0.5-cm allowance. It is, therefore, unnecessary to dissect any tissue [14]. Thus, high ligation of the ISV is a relatively painless surgery, although delicacy of manipulation is mandatory. The surgery creates a mere 3.0-cm-long opening, making it possible to use local anesthesia on an outpatient basis, as the overlying fatty layer is always very thin, even in males with central obesity. Choosing this operative area has the advantages of being low enough to apply local anesthesia, and high enough to avoid multiple venous channels. This type of local anesthesia is, of course, applicable to a varicocelectomy of a lower kind, although it may be difficult to perform in a heavily obese patient, but we have not yet encountered this situation.

We advise physicians to shorten and then enhance the major ISV after the pooled blood is squeezed out.

The venous trunk is sufficiently strong to sustain the increased suspension force to the ipsilateral testicle which, in turn, can solve the problem of testicular ptosis in which the testicle may touch the ground when the patient squats. The squeezing manipulation of the pampiniform plexus used during the operation is very helpful for increasing the visibility of the smaller veins and expelling the venous content. It is important that the assistant holds rather than squeezes the testicle proper, otherwise the patient may experience intolerable pain.

Postoperative wound pain is likely to be reported by patients; however, oral intake of analgesic medication appears to be indispensable in the 24 h postoperatively and sufficient for pain management. It is unnecessary to repair the muscle layer too tightly as the purpose of the muscle layer repair is approximation, otherwise, postoperative pain can occur as chronic ischemia, which can lead to fibrosis of these muscles. Some may question the usage of silk sutures for the closure of the muscle layer. However, we observed no complications in our study. Similarly, care should be taken not to encasing or traumatizing the iliohypogastric or ilioinguinal nerve, otherwise, iatrogenic numbness over the inguinal region may be irreversible.

Varicocele was traditionally described as being disadvantageous to spermatogenesis [15, 16], characterized by a low sperm count, poor motility and bizarre morphology. It mostly occurred among fertile young patients. Therefore, most surgical patients come from the sterile disease entity. In our practice, however, we observed that infertile patients accounted for only 33.2 % (191/575) of the study group. This unusually lower proportion might be a bias resulting from patients' recommendation in which many patients yearn for this surgery, but not for fertility reasons. Some investigators suggested that varicocelectomy may benefit erectile function [17], but further scientific research is needed to elucidate this point with prospective randomized trials, including clinical responses and hormone assays.

The low procedure-related complication rate was varied in published reports [18]. The low complication rate in our study seemed to be in accordance with those of other methodologies such as inguinal and subinguinal ones [18], although the risks associated with general anesthesia are unavoidable, particularly in recently developed laparoscopic operations [19]. Embolization has been reported, but these procedures were rather experimental at this point [20]. Meticulous dissection of all tissues and a precise manipulation of vessels not only made our procedure possible under local anesthesia on a true outpatient basis, but also resulted in minimal complications, such as paucity of hematoma, varicocele recurrence in only two patients, and hydrocele in one case, which was conservatively managed. Similarly, inadvertent traumatization to nearby tissues should be avoided because patients are only under local anesthesia. Furthermore, a financial benefit is promising. Savings on medical expenditure of approximately 30 % and 52 % were observed in our patients who underwent bilateral and unilateral varicocelectomy respectively, compared to the traditional method of anesthesia. However, the financial savings may be even more because the labor cost-savings were not estimated in this study.

In conclusion, the procedure of varicocelectomy, as described above, was shown in this study to be effective, reliable, reproducible and simple, and a safe method with minimal complications. It offers the advantages of more patient privacy, a lower morbidity, no notable adverse effects resulting from anesthesia, and a more rapid return to regular physical activity.

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