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Varicocoelectomy in adolescents: Laparoscopic versus open high ligation technique

João Moreira-Pinto[1,3], Angélica Osório[1], Fátima Carvalho[1], João Luís Ribeiro de Castro[2], José Ferreira de Sousa[1], Carlos Enes[1], Armando Reis[2], José Alfredo Cidade-Rodrigues[1]

ABSTRACT

Background: Treatment of varicocoele is aimed at eliminating the retrograde reflux of venous blood through the internal spermatic veins. The purpose of this investigation was to compare laparoscopic varicocoelectomy (LV) with open high ligation technique in the adolescent population. **Materials and Methods:** We retrospectively evaluated 33 adolescents who underwent varicocoelectomy at our paediatric hospital, between May 2004 and September 2008. Patients were divided into two groups depending on the technique: those who had an LV and those submitted to an open varicocoelectomy (OV). We analysed side, age of surgery, follow-up period and the incidence of recurrence/persistence, hydrocoele formation and wound complication. **Results:** There were 24 patients in the LV group and 9 in the OV group. All varicocoeles were in the left side. Mean age was 12 years in both groups. Mean follow-up time was 32 months for the LV group and 38 months for the OV group ($P = 0.49$). There was no significant difference in the incidence of hydrocoele in both the groups (25% versus 22%, $P = 0.626$). There was no recurrence/persistence on the LV group, while in the OV group there were three cases ($P = 0.015$). **Conclusion:** LV seems more efficient than open high ligation technique in the treatment of adolescents' varicocoeles. Larger series are necessary to draw more reliable conclusions.

Key words: Hydrocoele, varicocoele laparoscopic varicocoelectomy

INTRODUCTION

The incidence of varicocoele in young men is 15%. There are various treatments available for varicocoele. The common goal of all treatments is to eliminate the retrograde reflux of venous blood through the internal spermatic veins.[1] Success has been reported with high ligation using an open retroperitoneal approach through a suprainguinal incision, also known as Palomo procedure.[2] Other forms of treatment include ligation using Ivanissevich inguinal approach,[3] antegrade sclerotherapy,[4] retrograde embolisation, and microsurgical retroperitoneoscopic and laparoscopic procedures.[5,6] Laparoscopy is substituting the open retroperitoneal approach in the high ligation of the spermatic vessels for the treatment of varicocoele.[7] The aim of this investigation was to compare laparoscopic varicocoelectomy (LV) with open high ligation technique in the adolescent population.

MATERIALS AND METHODS

We retrospectively reviewed the charts of all patients who had undergone varicocoelectomy between May 2004 and September 2008 at our paediatric hospital. There were 45 surgeries performed. Exclusion criteria were history of ipsilateral orchidopexy or inguinal hernia repair, varicocoelectomy using techniques other than the laparoscopic or open high ligation, and less than 6 months follow up. Thirty-three patients were included in our study. All the patients had unilateral left varicocoele. Diagnosis was made by physical examination. Doppler ultrasound was performed only when there were doubts about the diagnosis. The indication for repair was varicocoele associated with a small testis, symptomatic varicocoele or physically or psychologically causing discomfort.[8]

The 33 boys in our study were submitted to either LV or suprainguinal/open varicocoelectomy (OV) depending on surgeon's preference for either technique. Each

[1]Department of Pediatric Surgery, [2]Pediatric Urology Unit, Centro Hospitalar do Porto, Porto, [3]Life & Health Sciences Institute (ICVS), Braga, Portugal

Address for correspondence:
João Moreira-Pinto,
Centro Hospitalar do Porto, Rua da Boavista,
n.º 827, 4050 - 111 Porto, Portugal.
E-mail: moreirapinto@gmail.com

surgeon used always the same technique independent of the patient. The results of these procedures were compared in terms of incidence of hydrocoele formation, recurrence/persistence of the varicocoele, testicular atrophy and wound complications such as infection, paraesthesia and inaesthetic scar.

At our hospital, both LV and OV are performed under general anaesthesia and as day surgery cases. In the LV, a 5-mm port is placed at the cephalad edge of the umbilicus. This is where a 30° scope is placed. Two further 5-mm working ports are inserted, under laparoscopic guidance, in the right iliac fossa at the midclavicular line and in the left iliac fossa [Figure 1]. The posterior peritoneum is incised lateral or anterior to the spermatic cord as higher as possible. We do a mass ligation using an ultrasound sealing device. Lately, we manage to do the varicocoelectomy using only the first two ports. One can gently grasp and incise the peritoneum just using the ultrasound sealing device and then dissect the spermatic vessels using the same technique.

In the OV, a 5-cm suprainguinal incision is made just medial to the anterior iliac crest. The peritoneum is mobilised medial. The spermatic vessels are identified and the vessels are doubly ligated and divided. The spermatic artery is not preserved, as described by Palomo.[2]

Patients are seen 1 and 6 months after surgery. Imaging studies and other follow-up visits are determined by the attending surgeon. In order to get updated reliable data for this study, a third clinical evaluation was undertaken at the time of collecting the data by a paediatric surgeon who had not participated in any of the surgeries. This surgeon was responsible to collect and work the data.

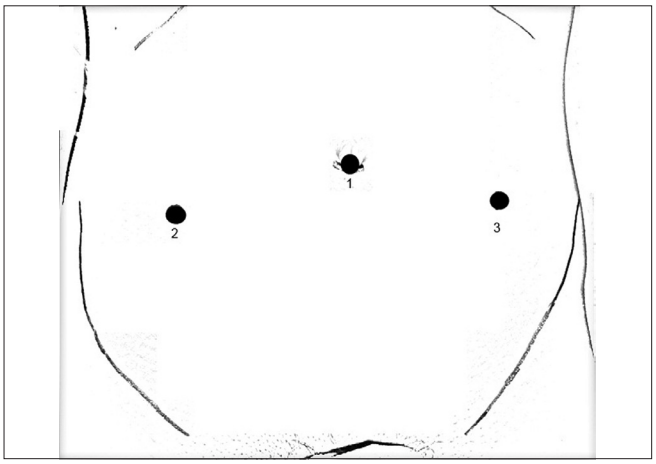


Figure 1: Trocar placement for laparoscopic varicocelectomy

Comparisons between groups were made by means of the independent Student's *t* test, for ordered discrete or continuous variables, and the Fisher's exact test for categoric variables. $P < 0.05$ was considered statistically significant. All analyses were performed with SPSS software (SPSS 15.0).

RESULTS

All the 33 patients included in our study had unilateral left varicocoelectomy. Twenty-four patients had an LV and 9 had an OV. The mean age at surgery was 12.67 ± 1.689 years (minimum = 7, maximum = 18). The mean follow up was 33.27 ± 17.463 months. The two groups were compared [Table 1]. The groups did not significantly differ with regard to age at surgery or follow-up period. No testicular atrophy was reported in either group. We did not find any wound complication. The incidence of hydrocoele formation was similar between the two groups (25% for LV versus 22% for OV, $P = 0.626$). There was no recurrence/persistence on the LV group while in the OV group there were three cases with recurrence ($P = 0.015$).

DISCUSSION

When deciding on the surgical approach to varicocoele repair in an adolescent, it is important to consider the advantages and disadvantages of the various surgical approaches. The perfect technique in terms of low recurrence rate and low hydrocoele formation is not yet decided.[9]

LV has been shown to be at least equally as effective as OV.[10] Laparoscopy has been shown to have same intraoperative safety, shorter hospitalisation, less postoperative complication compared to open surgery, and a significant improvement in seminal analysis (same as open surgery).[10-12] Although having the lowest failure rate, LV has the highest hydrocoele formation rate.[13] Since its first description in 1988, the laparoscopic Palomo technique has gained popularity and has been considered the preferred method for paediatric and adolescent patients.[7]

Table 1: Results of LV versus open high ligation varicocoelectomy (OV)

	LV (24 patients)	OV (9 patients)	*P* value
Mean age, years	12.63	12.78	0.850
Mean follow up, months	32	38	0.490
Hydrocoele	6 (25%)	2 (22%)	0.626
Recurrence/persistence	0 (0%)	3 (33%)	0.015

Although the study presented is retrospective, we can be sure that some kind randomisation was achieved as each surgeon performed only one type of surgery independent of the patient presented. Moreover, the evaluation by a surgeon not participating in any of the surgeries makes the collected data more reliable. This surgeon worked as a "third party" making an impartial evaluation.

Our data suggest that LV is more effective in treating varicocoele. The high recurrence/persistence rate reported in the OV group (33%) might be justifiable by the number of patients submitted to OV excluded from our study. The majority of patients submitted to OV had only one visit in the first month post surgery and were recommended to return only if they noticed any signs of recurrence or hydrocoele formation. As they did not come to the "third party" consultation, 6 out of 15 patients submitted to OV were excluded from our study because of short follow-up period. Another explanation is that in some patients submitted to OV, small venous collaterals might be missed. The dilatation of small collateral veins following Palomo procedure was described previously by Feber and Kass.[9] That was in fact what we verified when re-operating one of these patients by laparoscopic approach. Unfortunately, not all recurrences were operated at our hospital. So, we cannot be sure what their causes were. Although this high recurrence/persistence rate in the OV group might be overestimated, having no recurrence/persistence cases in the LV group makes us suspect that this is the best method to cure varicocoele in adolescence.

Incidence of hydrocoele formation was similar in both the groups and consistent with that reported by most authors.[14-16] Theoretically, the ideal surgical option is that which excludes venous drainage possibilities of the testicle but prevents lymphatic accumulation. In the last few years, some groups have attempted to improve the secondary hydrocoele formation rate using methods to identify and spare lymphatics.[17-21]

Schwentner *et al*. tried injecting isosulphan blue between dartos and tunica vaginalis in a randomised trial of 50 patients. They reported a hydrocoele rate of 0% and a persistence rate of 4%, which resolved spontaneously at 6 months.[17] Other studies support dye injection and none reports postoperative hydrocoele formation. The major problem is that 8% of patients may have a blue-stained scrotum for up to 6 months following surgery.[18-21]

Kocvara *et al*. described a laparoscopic Palomo technique with lymphatic preservation. They reported a hydrocoele rate of 2.9% in the lymphatics preserved group compared to 17.9% in the conventional group. However, there was a 6.7% persistence rate in the lymphatics sparing varicocoelectomy group and an 8.9% persistence rate for the non-lymphatics sparing varicocoelectomy one.[22] More recently, Glassberg *et al*. compared the conventional Palomo laparoscopic technique with a lymphatic sparing one. Lymphatic sparing laparoscopic varicocoelectomy was associated with decreased incidence of postoperative hydrocoele requiring surgery (3.4% versus 11.4%) and no significant difference in incidence of persistence/recurrence rate (2.9 and 4.5%, respectively).[23]

CONCLUSIONS

LV seems more efficient than open high ligation technique in the treatment of adolescents' varicocoeles. Recent data suggest that preserving lymphatic drainage can diminish hydrocoele formation rate. An attempt to preserve the maximum number of small lymphatics should be made. Larger series are necessary to draw more reliable conclusions.

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