Clinical studies

Conventional Open High Ligation versus Laparoscopic Varicocelectomy – Which Is the Best Choice?

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Abstract

Introduction and Objectives. Varicocele is one of the most common causes of infertility. Our aim was to compare laparoscopic varicocelectomy (LV) versus open varicocelectomy (OV) in terms of operative and postoperative outcomes.

Materials and Methods. A number of 32 patients with a mean age of 29.6 years underwent open (14) and laparoscopic (18) left side varicocelectomy during May 2017 and May 2018 was analyzed. All patients performed testicular ultrasonography and spermogram before the procedure.

Results. LV is performed under general anesthesia, while OV under local or spinal anesthesia. Mean operating time was 37.2 minutes for LV and 53.3 minutes for OV. The mean hospital stay was 1.2 days for LV versus 1.9 days for OV. The overall incidence of postoperative complications including hydrocele, epididymitis, scrotal edema and local pain was significantly higher among patients undergoing OV compared with LV (14.2% vs 5.5%). The incidence of persistent varicoceles was not significantly different between the 2 groups. Also, there was no incidence of testicular atrophy in both groups. Semen characteristics - sperm motility and density - improved in both groups.

Conclusions. LV is less invasive than OV and had better outcomes in terms of complications and of operative parameters, so it should be considered first choice in treatment of male varicocele, being safe and effective. In addition, laparoscopic procedure is recommended in case of bilateral disease.

Key-words: varicocele, laparoscopy, open surgery.

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Introduction and Objectives

Infertility is a global health concern, and affects more and more men, especially in developing countries, with an average rate of 6-9% [1]. Most common reversible cause of infertility in men is varicocele [2]. Most of the varicoceles are left-sided, unilateral. There are various medical and surgical techniques for the cure of varicocele, including embolization, open surgical techniques, microsurgery, minimally invasive techniques, as laparoscopic varicocelectomy (LV). There is no “gold-standard” of varicocele treatment, but among them surgery has very good outcome and it improves sperm parameters. Each technique has its own advantages and disadvantages, with contradictory results reported in the literature [3-8].

Our study aimed to compare open varicocelectomy (OV) to laparoscopic technique regarding the treatment of varicocele and post-surgery outcome and complications.

Materials and Methods

We retrospectively analyzed a number of 32 infertile men, diagnosed with varicocele, selected from patients referred to our urology center in Saint John Hospital, Bucharest between May 2017-2018. For each patient we underwent physical examination and semen analysis. Also for each subject a scrotal Doppler ultrasonography confirmed the diagnosis. Normal semen samples are characterized by WHO definition. Sperm concentration was abnormal in all subjects.

For 18 patients (56.25%) we underwent left laparoscopic varicocelectomy (among these, 2 patients (11%) underwent bilateral varicocelectomy) and for 14 patients (43.75%) we opted for open approach – Ivanissevich technique. Open technique was done under spinal anesthesia and laparoscopic approach under general anesthesia. The inclusion criteria included: patients over 18 years old, having chronic testicular pain, modified spermogram (oligospermia, low mobility of spermatozoids) and testicular ultrasonography.

All surgeries were performed by 4 urologists (2 general surgeons assisted the urologists in laparoscopic technique). Written informed consent was signed by all patients.

For the laparoscopic technique, we used three trocars technique, with carbon dioxide insufflation. We identified the spermatic vessels individually [Figure 1] and we used clips to ligate the veins, preserving the spermatic artery in all cases. All the patients were followed-up at three months.

Results

There were 18 patients in the laparoscopic group (LV) and 14 patients in the open group (OV). Mean age of the groups is 29.6 ± 5.1 years old, with no significantly difference between the two groups.

Mean operation time: 37.2 minutes in laparoscopic technique versus 53.3 minutes in open approach. Anesthesia required for laparoscopic technique was general versus spinal for open surgery.

After surgery, the laparoscopic technique was significantly associated with fewer complications compared to the open technique (11.1% vs 21.4%). Postoperative pain was different in the two groups: 14.2% for the open technique compared to 5.5% for the laparoscopic technique. Pneumoscrotum was found in the laparoscopic group (n=1), whereas hydrocele and hematoma in open group (n=2). We did not record any bowel lesions or hernia after LV. There were 2 laparoscopic cases with bilateral varicocele, where the mean operation time and the complications rate were not significantly different in comparison with the single size varicocele. At three months from the intervention, in 96.8% of the patients, with 100% in LV and 92.8% in OV, there was observed a remission of the varicocele, with a spermogram improvement in terms of: volume (1.9 vs 2.4 ml for LV and 1.8 vs 2.0 ml for OV), sperm concentration (11 vs 20 million/ml for LV and 10 vs 19 million for OV), progressive motility value (29% vs 44% for LV and 28% vs 41% for OV), total motility (30% vs 41% for LV and 24% vs 43% million for OV) and normal morphology (3% vs 25% for LV and 2% vs 23% for OV) [Table 1].
Table 1. The spermogram evaluation before the intervention.

<table>
<thead>
<tr>
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<th>Before LV</th>
<th>After LV</th>
<th>Before OV</th>
<th>After OV</th>
</tr>
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<tbody>
<tr>
<td>Sperm volume</td>
<td>1.9 ml</td>
<td>2.4 ml</td>
<td>1.8 ml</td>
<td>2.0 ml</td>
</tr>
<tr>
<td>Sperm concentration</td>
<td>11 million/ml</td>
<td>20 million/ml</td>
<td>10 million/ml</td>
<td>19 million/ml</td>
</tr>
<tr>
<td>Progressive Motility value</td>
<td>29%</td>
<td>44%</td>
<td>28%</td>
<td>41%</td>
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<tr>
<td>Total motility</td>
<td>30%</td>
<td>41%</td>
<td>24%</td>
<td>43%</td>
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<tr>
<td>Normal morphology</td>
<td>3%</td>
<td>25%</td>
<td>2%</td>
<td>23%</td>
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Discussions

After varicocelectomy, parameters of sperm – quality and quantity - improved in both groups; results are slightly better for the open procedure. Preserving the artery is one of the main concerns of this surgery; it is proven that postoperative sperm density significantly improved when the artery was preserved [9]. This has a positive effect on the improvement of the testicular function.

In our study it was reported a statistically significant difference on the operative time for the laparoscopic varicocelectomy compared to Ivanissievich procedure (41.2 vs 45.3 min). The shorter time of the LV is probably because of the great experience of the general surgeons in laparoscopy.

Hospital stay was another parameter found with a significantly statistically difference, with 1.2 days for LV compared to 1.9 days for OV (p=0.008). This could be considered a well-known benefit of minimally invasive surgery. The complications rate after open surgery is reported to be higher than in laparoscopic procedure, and our study sustains this fact, with 5.5% vs 14.2% (rate of postoperative complications). According to the literature, hydrocele is the complication found after both, laparoscopic and open procedures [3]. Meanwhile, we found post-surgery hydrocele only for the open technique (n=4). Local pain is predominant in OV than in LV (9% versus 3%), lesser pain being one great advantage of laparoscopic surgery. According to Schlegel et al., pain is the predominant complaint in 2% to 10% of patients with varicoceles. Patients describe pain as heaviness or a dull ache, generally after prolonged ambulation, worsening with physical activity and straining. Also, in terms of complications and the operator time, it was proven that laparoscopic varicocelectomy has advantages for bilateral disease [11], with similar outcomes described in the literature. When regard the remission of the disease after the intervention, of 96.8% in our study, it could be observed that this is similar with the literature data, between 90-99% of cases [12]. Overall, compared to open varicocelectomy, in laparoscopic technique complications are rare.

It is also important to mention that sperm parameters improve by 3 months after varicocele repair and then do not improve further [13].

Conclusions

Laparoscopic varicocelectomy is a safe procedure, proven to have great outcome and influence sperm parameters. However, further studies on different operator methods and on large cohorts are necessary to evaluate the best operator choice in patients with varicocele.

References