Is Laparoscopic Inguinal Hernia Repair an Operation of the Past?

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There is an ongoing debate about whether to repair primary, unilateral inguinal hernias by the laparoscopic or the open method. Many agree that laparoscopic repair is better for bilateral or recurrent hernias, but its use for primary, unilateral hernias is controversial. Sixteen randomized, controlled trials and metaanalyses that compared these two techniques demonstrated that laparoscopic repair has a definite role in modern surgery (Table 1). The VA Cooperative Study is the most recently published large, prospective, randomized, controlled trial that compared laparoscopic to open repair. The authors concluded that open inguinal hernia repair is superior to laparoscopic inguinal hernia repair. They based their conclusion on a higher overall recurrence rate in the laparoscopic group (10% versus 4.9%) and a higher complication rate in the laparoscopic group (39% versus 33%).¹ This article might make one believe that laparoscopic inguinal hernia repair is a procedure of the past. A thorough analysis of this admirable and ambitious project reveals many flaws; it simply cannot be accepted as the definitive work in this field. In this article we will discuss the drawbacks of the VA Study, and we will also delineate the shortcomings of some of the other published reviews in an attempt to illustrate why laparoscopic inguinal hernia repair is not a procedure of the past.

Hernia revisited

Hernia comes from the Greek word hernios, which means offshoot or bud. In his book entitled Hernia, Nyhus² stated, “The history of hernia repair is the history of surgery.” It might seem that advancements in hernia surgery have surpassed the work of early surgeons. Lau,³ in his history of inguinal hernia repair, pointed out that early laparoscopic surgery failed because the tenets of open surgery were not followed. When the basic principles of hernia surgery were revisited, laparoscopic methods began to succeed. To ensure low complication and recurrence rates, it is essential to have a complete understanding of the anatomy of the inguinal region. In his 1804 monograph, Cooper stated, “No disease of the human body, belonging to the province of the surgeon, requires in its treatment a greater combination of accurate anatomic knowledge, with surgical skill, than hernia in all its varieties.”⁴ The VA Trial failed to monitor or standardize the techniques used for repair.

The VA Study versus hernia repair in the 21st century

After appendectomy, hernia repair is the most frequently performed general surgery operation. In the United States, there are more than 700,000 repairs performed each year.⁵ McKinsey and Co estimated that laparoscopic inguinal herniorraphy would become the procedure of choice a few years after it was introduced. They predicted that from 1993 to 1995, 50% of all repairs would be done laparoscopically. Today, the number of inguinal hernias repaired by the minimally invasive technique is well below 50%. Why? The recommendation of the National Institute of Clinical Excellence (NICE) states that open mesh repair should be the procedure of choice for primary inguinal hernia and that the laparoscopic approach should be limited to bilateral or recurrent hernia.⁶

Laparoscopic inguinal hernia repair is a safe and reasonable procedure. The complication rate is very low, comparing favorably with open repair (Table 2). The VA Cooperative Study concluded that the rate of complications was higher in the laparoscopic group (39%) than in the open group (33%). It did not break down the complications according to whether a transabdominal preperitoneal (TAPP) or total extraperitoneal (TEP) repair was done. One large metaanalysis found that TAPP repair has a higher rate of serious complications than TEP, with vascular and visceral injuries more frequent in the...
The recurrence rate after laparoscopic inguinal hernia repair can be seen in Table 3. As the table illustrates, there is not a significant difference in recurrence rates between laparoscopic and open repair. The VA Trial found a higher recurrence rate after laparoscopic repair (10.1% versus 4.9%). This rate is significantly higher than that quoted in other articles (Table 3). Interestingly, there was a lower recurrence rate in the laparoscopic repair for recurrent hernias. Post hoc analysis demonstrated that surgeons who had done more than 250 laparoscopic repairs had a 5% recurrence rate; this rate is half that for “less experienced” surgeons. This may be testimony to the steep learning curve for laparoscopic repair. But 250 repairs are many more cases than most experienced laparoscopic hernia surgeons consider necessary to gain expertise. The trial reported a very high rate of conversion to open surgery. This is disturbing as well. The recent clinical trial that compared open with laparoscopic colectomy required surgeons to submit a video that demonstrated competence in performing the procedure before entering cases in the study. This type of quality control is needed in a technique-dependent surgery trial.

Those who advocate laparoscopic repair believe it is superior for several reasons. Postoperative pain is decreased and there is a shorter recovery time. The repair enables one to inspect both groins for a potential hernia.
that was not clinically diagnosed and to avoid the scarred operative site when repairing a recurrent hernia. The surgeon is able to use the mesh to cover entirely the myopectineal orifice. The large metaanalyses, and the VA Trial, confirmed that laparoscopic repair leads to less postoperative pain, a shorter convalescence, and faster return to work.7-9,20 Tables 4, 5, and 6 illustrate these points well. The procedure takes longer to perform and is more costly (Tables 7 and 8). Many of the studies compare laparoscopic repair with open tension repairs such as the Bassini or Shouldice repairs (Table 1). It has been shown that pain is less and recurrences are lower with open tension-free repairs.22 The VA Cooperative Study was designed more appropriately in that all open repairs were tension-free Lichtenstein repairs.

Although it seems clear that several of the conclusions of the VA Trial are questionable, the study has been published during a time when many are looking for a reason to doubt the validity of laparoscopic inguinal hernia repair. This may be due, in part, to the way that the majority of metaanalyses and randomized controlled trials are conducted. There are several drawbacks to many of the conclusions gleaned from the larger body of published literature. The analysis of postoperative pain and return to work exemplify this phenomenon.

The time to return to work was analyzed in several articles. The data are rather subjective. It is clear that the type of work to which a patient is returning will influence how long he needs to be away from work. For example, a patient with a job that entails heavy lifting might need a much longer time away from work than someone who sits at a desk. Some patients might be receiving pay while they are on sick leave, so they have less of an incentive to go back to work.23 Many studies do not address these variables.

There seem to be several issues that were not addressed consistently regarding assessment of postopera-
tive pain. One author commented on neuralgia inguinodynia and quoted a 20% rate of nerve entrapment. The studies rarely mentioned whether the surgeon identified the ilioinguinal and iliohypogastric nerves during open dissection. Laparoscopic repair also puts several nerves at risk of entrapment and it is rarely mentioned whether the nerves were visualized or avoided during dissection. The topic of mesh fixation is also important in considering postoperative pain. Stoppa advocated placing the mesh without fixation in the preperitoneal space to avoid nerve injury. It is argued that if one uses a large enough piece of mesh, with good overlap, fixation is unnecessary. The majority of articles did not mention whether the mesh was tacked or sutured in place in the laparoscopic arm of the study.

Despite all of the caveats mentioned previously, it seems clear that there is a shorter recovery period and less postoperative pain after laparoscopic repair. The VA Cooperative Study concluded that open repair is better for primary inguinal hernias. This failed to take into account the patient’s pain and postoperative recovery period. There is an undertone of reluctance in embracing laparoscopic inguinal hernia repair. As Kurzer and co-workers stated, “It is a testimony to the simplicity, safety, and effectiveness of open tension-free hernioplasty that the results from surgeons with no special interest or expertise in hernia repair are identical to those with a special interest in the subject.” The VA Study confirmed the need for a high degree of technical expertise to avoid high recurrence and conversion rates.

A carefully conceived and executed study is needed to better define the role of laparoscopic inguinal hernia repair. Laparoscopic repair may not be a procedure for the average general surgeon unless one is committed to mastering technical expertise. The repair is a technically challenging procedure with a steep learning curve. There must be rigorous entry criteria for both patients and surgeons in a setting of consistent repair technique(s). The future will likely reveal that laparoscopic inguinal hernia repair, performed by the experienced surgeon, has a role in primary and recurrent inguinal hernia repair.

Table 7. Length of Operation

<table>
<thead>
<tr>
<th>First author</th>
<th>Laparoscopic</th>
<th>Open</th>
</tr>
</thead>
<tbody>
<tr>
<td>McCormack</td>
<td>14.8 min longer</td>
<td>(p &lt; 0.0001)</td>
</tr>
<tr>
<td>Memon</td>
<td>15.2 min longer</td>
<td>(p &lt; 0.0001)</td>
</tr>
<tr>
<td>Grant</td>
<td>No significant difference</td>
<td>No significant difference</td>
</tr>
<tr>
<td>MRC Lap Groin Hernia Trial Group</td>
<td>58.4 min</td>
<td>43.3 min</td>
</tr>
<tr>
<td>Bringman</td>
<td>50 min</td>
<td>36 min for plug and patch</td>
</tr>
<tr>
<td>Picchio</td>
<td>49.6 min</td>
<td>33.9 min (p &lt; 0.001)</td>
</tr>
<tr>
<td>Lawrence</td>
<td>72 min</td>
<td>32 min (p &lt; 0.0001)</td>
</tr>
<tr>
<td>Chung</td>
<td>Laparoscopic longer in all groups</td>
<td>—</td>
</tr>
<tr>
<td>Wright</td>
<td>58 min</td>
<td>45 min (p &lt; 0.0001)</td>
</tr>
</tbody>
</table>

Table 8. Cost

<table>
<thead>
<tr>
<th>First author</th>
<th>Laparoscopic</th>
<th>Open</th>
</tr>
</thead>
<tbody>
<tr>
<td>MRC</td>
<td>314 more pounds</td>
<td>—</td>
</tr>
<tr>
<td>Johansson</td>
<td>7,063 SEK</td>
<td>417 SEK (mesh)</td>
</tr>
<tr>
<td></td>
<td>0 SEK (no mesh)</td>
<td></td>
</tr>
<tr>
<td>Andersson</td>
<td>$1,091 higher</td>
<td>(p &lt; 0.001)</td>
</tr>
<tr>
<td></td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>Lawrence</td>
<td>850 pounds</td>
<td>268 pounds</td>
</tr>
</tbody>
</table>

REFERENCES

8. McCormack K, Scott NW. Laparoscopic techniques versus open


