Extraperitoneal Laparoscopically Assisted Ilioinguinal Lymphadenectomy for Treatment of Malignant Melanoma

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Background: Current treatment of malignant melanoma of the leg includes ilioinguinal lymphadenectomy (IIL). Standard open IIL (open IIL) includes sectioning of the inguinal ligament to gain access to the iliac nodes. Extraperitoneal laparoscopic IIL (lap IIL) is a feasible, less aggressive approach. It can be combined with standard superficial lymphadenectomy for treatment of malignant melanoma.

Design: Comparative, prospective, nonrandomized series.

Setting: Tertiary care center.

Patients: Twelve consecutive, unselected patients with malignant melanoma treated with lap IIL (group 1) were compared with 10 consecutive, unselected patients with malignant melanoma on whom open IIL was performed (group 2).

Interventions: Standard open IIL and laparoscopic extraperitoneal iliac lymphadenectomy (lap IIL) plus superficial groin lymphadenectomy.

Main Outcome Measures: Operative time, intraoperative complications, requirements of analgesia, total volume of lymphatic drainage, number of lymph nodes retrieved, immediate morbidity, hospital stay, and long-term morbidity were evaluated.

Results: Operative time was significantly longer for the lap IIL group (group 1) than for the open IIL group (group 2) (177±44 vs 140±18 minutes, respectively; \( P < .05 \)), but no patients in group 1 needed conversion to open surgery or developed related complications. Overall lymphatic drainage was significantly lower in group 1 than in group 2 (615±518 mL vs 1393±793 mL, respectively; \( P < .01 \)). The number of doses of analgesics (13±8 vs 31±22, \( P < .03 \)) and length of postoperative stay (7.3±3.3 vs 13±5 days, \( P < .006 \)) were also significantly lower in the laparoscopic group. The overall number of lymph nodes retrieved was similar in both groups (10.2±4.6 vs 10±3, \( P = .9 \)). One patient developed a groin hernia of 6 cm after open IIL.

Conclusions: Laparoscopically assisted IIL offers a less aggressive approach than open IIL and entails less pain and a shorter hospital stay, as we observed in 2 groups with similar oncological results (mainly, a similar number of lymph nodes retrieved) who were treated with one procedure or the other. Further research should be done to confirm these preliminary advantages in a prospective randomized trial with long-term follow-up.

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Current treatment of malignant melanoma (MM) of the leg includes ilioinguinal lymphadenectomy (IIL) in selected cases for staging or curative purposes.\(^1\) Standard open IIL includes sectioning of the inguinal ligament to gain access to the iliac and obturator lymph nodes.\(^3\) However, this step entails destruction of an anatomical structure, the repair of which is accompanied by local pain and the long-term possibility of hernia.\(^4\) In recent years, transperitoneal\(^5\)\(^6\) or extraperitoneal\(^7\)\(^8\)\(^9\) laparoscopic lymph node sampling or complete lymphadenectomy has been shown to be a useful and minimally invasive therapy in the preoperative management of pelvic organ malignancies (eg, prostate, bladder, or cervical carcinoma). The combination of laparoscopy and iliac lymphadenectomy with standard superficial lymphadenectomy offers a less aggressive approach to the treatment of MM of the leg. We present the preliminary results of a series of laparoscopically assisted IIL procedures (lap IIL),\(^10\) and compare them with the results of a series of 10 standard open IIL procedures. Between March and December 1996, we performed lap IIL on 12 unselected consecu...

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PATIENTS AND METHODS

All patients (n=12) who required IIL for treatment of MM of the leg between March and December 1996 were included prospectively in a series of laparoscopically assisted IIL procedures (group 1, lap IIL). The last 10 patients who underwent open IIL were retrospectively reviewed for comparison (group 2, open IIL). Age, sex, location of primary malignant melanoma, clinical stage, operative time, intraoperative complications, analgesia requirements, total volume of lymphatic drainage, immediate morbidity, hospital stay, and long-term morbidity were evaluated.

Open IIL was performed according to the technique described in 1981 by Karakousis. Briefly, the technique involves a longitudinal incision from 5 cm above the inguinal line to the upper third of the thigh; 2 flaps are laterally dissected. The saphenous vein is ligated at the inferior end of the wound, and the fatty and lymphatic tissues are dissected away from the femoral vessels. The saphenous vein is ligated and severed at its insertion to the femoral vein. Then, the inguinal ligament is sectioned laterally, and access to the retroperitoneal pelvic space is gained with blunt dissection. Lymph nodes covering the iliac vein and obturator orifice are excised. The inguinal ligament is reconstructed with resorbable sutures, and the wound is closed with 2 aspirative drains.

Laparoscopically assisted IIL involves making a 2-cm incision below the umbilicus and the midline abdominal rectus sheath. A blunt dissection of the preperitoneal space is performed with the finger or assisted by a preperitoneal dissection balloon (Origin, Menlo Park, Calif) that creates a working space. A Hasson trocar with balloon (Origin) is inserted and carbon dioxide infused to maintain the space, and 2 additional trocars are inserted. After location of the main landmarks, the Cooper ligament and the iliac vein, the dissection is initiated from the most cephalad point of the vein, uncovering the superior and medial surfaces of the iliac artery and vein. The inferior margin of the dissection is the node of Cloquet, immediately posterior to the crural space. The dissection is continued laterally to the obturator foramen, avoiding injury to small veins and the obturator nerve. After the iliac dissection, lymph nodes are retrieved in a plastic bag to avoid wound contamination. A superficial inguinal lymphadenectomy is then performed as described in the open IIL procedure.

In both groups, simultaneous MM scar reexcision (including the scar tissue and 2 to 3 cm of surrounding tissue) was performed if needed. Postoperative treatment was similar for both groups, with the use of compression panty hose to prevent lymphedema and the encouragement of early mobilization of the patient. Patients remained in the hospital until lymph drainage ceased. Aspirative drains were withdrawn when daily drainage was below 30 mL.

Surgical therapy for MM includes IIL for staging or treatment of stages I and II. 1, 2 During IIL, the access to the iliac vessels is through a nonanatomic plane that requires the destruction of the inguinal ligament. 3 This step is especially aggressive, it sometimes fails to provide a clear view of the

Table 1. Differential Demographic Features of 2 Groups of Patients With Ilioinguinal Lymphadenectomy*

<table>
<thead>
<tr>
<th>Features</th>
<th>Group 1, Lap IIL (n=12)</th>
<th>Group 2, Open IIL (n=10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, y, mean±SD</td>
<td>46±17</td>
<td>59±10</td>
</tr>
<tr>
<td>Sex, F/M</td>
<td>6/5</td>
<td>7/2</td>
</tr>
<tr>
<td>Previous abdominal surgery</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Breslow level, mm</td>
<td>1.5-2.5</td>
<td>2</td>
</tr>
<tr>
<td>&gt;4</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>MM site (lumbar/leg/feet)</td>
<td>1/4</td>
<td>1/5/4</td>
</tr>
<tr>
<td>Clinical groin adenomegalies</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Previous contralateral IIL</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

*Demographic differences were not significant. Lap IIL indicates laparoscopically assisted ilioinguinal lymphadenectomy; open IIL, standard open ilioinguinal lymphadenectomy; and MM, malignant melanoma of the leg.

See Invited Commentary at end of article

There were no complications related to the laparoscopic procedure, although 1 patient could not resume oral intake until 48 hours later due to nausea and vomiting. There were no general complications in either group, but local morbidity (skin wedge necrosis, wound infection, or seroma) appeared in 3 patients in group 1 (lap IIL) and 5 in group 2 (open IIL). Overall lymphatic drainage (sum of daily drainage volume) was significantly lower for group 1 patients than for group 2 patients (615±518 vs 1393±793 mL, respectively; P<.01). The number of doses of analgesic drugs required (13±8 vs 31±22, P<.03) and the length of postoperative stay (7±3.3 vs 13±5 days, P<.006) were significantly shorter in the laparoscopy group than in the open IIL group. The overall number of lymph nodes retrieved was similar in both groups (10.2±4.6 vs 10±3, P=.9). One patient developed a groin hernia 6 months after open IIL (Table 2).
iliac vessels, and appropriate sampling of iliac lymph nodes is not always obtained. Moreover, reconstruction of the inguinal ligament adds tension and pain to the area of the superficial lymphadenectomy. Long-term complications of IIL (crural hernias) can develop.6,8

During recent years, laparoscopic lymphadenectomy has gained interest, mainly in urology, for staging of bladder, penile, prostate, or gynecological cancer, or palliative treatment for recurrent iliac melanoma.10 Laparoscopic lymphadenectomy can be performed transthoracically7-10 or via an extraperitoneal11-13 approach. Extra-peritoneal access offers the advantage that the peritoneum is not entered, avoiding intra-abdominal injuries or sources of adhesions. With the extraperitoneal approach, a clear view of the iliac vein is obtained, and lymph nodes of the obturator, retrocrural, and iliac areas are easily dissected. Potential advantages of the combined approach are (1) the inguinal ligament is not compromised, (2) the pain caused by the tension reconstruction of the ligament is avoided, and (3) the long-term complications associated with IIL (crural hernias) are prevented.

The results of this prospective but unrandomized preliminary study suggest that lap IIL is feasible without additional morbidity, and they confirm the expected advantages of a less-aggressive approach. Laparoscopic IIL requires a longer operative time but patients require fewer analgesic drugs and a shorter stay in the hospital. Another interesting finding was that total lymphatic drainage volume was reduced after the combined approach. All these differences can be attributed to the avoidance of inguinal ligament section and tension reconstruction. The decrease in lymph drainage is more difficult to explain, but may be related to the avoidance of vein compression due to ligament reconstruction, leading to less local edema.

Another important aspect to consider is whether lap IIL leads to retrieval of the same number of lymph nodes as an open approach. The results of this study, in which the total number of lymph nodes (iliac plus inguinal lymphadenectomy) of the specimen was recorded, show a similar yield with both techniques. In lap IIL, however, special care must be taken to ensure that the nodes are not crushed and to retrieve the specimen enclosed in a bag, to avoid cell spillage and wound implants.14

Table 2. Differential Results of Procedures in 2 Groups of Patients With Ilioinguinal Lymphadenectomy

<table>
<thead>
<tr>
<th>Results</th>
<th>Group 1, Lap IIL (n=12)</th>
<th>Group 2, Open IIL (n=10)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operative time, min†</td>
<td>177±44</td>
<td>140±18</td>
<td>.05</td>
</tr>
<tr>
<td>Reexeresis of primary MM site</td>
<td>8</td>
<td>5</td>
<td>.9</td>
</tr>
<tr>
<td>Postoperative wound morbidity</td>
<td>3</td>
<td>3</td>
<td>.27</td>
</tr>
<tr>
<td>Overall lymph drain volume, mL†</td>
<td>615±518</td>
<td>1393±793</td>
<td>.01</td>
</tr>
<tr>
<td>Analgesia, No. of doses†</td>
<td>13±8</td>
<td>31±22</td>
<td>.03</td>
</tr>
<tr>
<td>Postoperative stay, d†</td>
<td>7.7±3.3</td>
<td>13±5</td>
<td>.006</td>
</tr>
<tr>
<td>No. of lymph nodes retrieved†</td>
<td>10.2±4.6</td>
<td>10±3</td>
<td>.9</td>
</tr>
<tr>
<td>Late morbidity</td>
<td>…†</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

* Lap IIL indicates laparoscopically assisted ilioinguinal lymphadenectomy; open IIL, standard open ilioinguinal lymphadenectomy; and MM, malignant melanoma of the leg.
† Data are expressed as mean±SD.
‡ There was no late morbidity in group 1.

Objections to lap IIL are longer operative time and increase in operative costs, but these are compensated for by a shorter in-hospital stay. Also, the longer operative time may be a result of the steeper learning curve required by a more technically complex procedure. The potential advantages of lap IIL are jeopardized by the fact that the main source of immediate morbidity is the superficial inguinal lymphadenectomy (skin necrosis and longer period of lymphatic fluid drainage). A future point of study should be the development of an operative technique of endoscopic or minimally invasive superficial lymphadenectomy with the aim of avoiding skin necrosis and unaesthetic large inguinal scars.13

The satisfactory preliminary results of this study invite the design of a prospective and randomized trial to analyze immediate comfort issues (analgesic requirements and ankle mobility), similar lymph node yield, long-term morbidity, oncological local control of the disease, and costs of the procedure.


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REFERENCES