Original article:

Comparative study of Onlay Mesh Hernioplasty for inguinal hernia repair under Hernia Block and under Spinal Anaesthesia

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Abstract:

Introduction: Elective inguinal hernia repair may be performed under general anaesthesia, regional anaesthesia (epidural or spinal) or local anaesthesia (ilioinguinal-iliohypogastric nerve block anaesthesia). The choice of anaesthesia depends on several factors, including patient and surgeon preferences, feasibility of the technique in a given patient, intra and post operative pain control, early recovery and monitoring requirements, post operative morbidity and peri-operative costs.

Material and methods: The study was conducted at Dr.Hedgewar Rughnalaya which represents tertiary centre located in Aurangabad City, divisional place of Maharashtra, which serves a large population of the community of different socioeconomic levels. The study comprises of 100 patients who underwent Onlay Inguinal Mesh Hernioplasty.

Results: There was significant difference noted between the pain experienced between the two groups after surgery. At 5% level of significance, there was no significant difference noted between the pain experienced between the two groups after surgery.

Conclusion: From this study, we conclude that hernia block is a simple, safe and effective technique of anaesthesia to perform inguinal mesh hernioplasty in uncomplicated inguinal hernias.

Introduction:

Elective inguinal hernia repair may be performed under general anaesthesia, regional anaesthesia (epidural or spinal) or local anaesthesia (ilioinguinal-iliohypogastric nerve block anaesthesia). The choice of anaesthesia depends on several factors, including patient and surgeon preferences, feasibility of the technique in a given patient, intra and post operative pain control, early recovery and monitoring requirements, post operative morbidity and peri-operative costs. Both the ilioinguinal and iliohypogastric nerves originate from the first lumbar spinal root. Superomedial to the anterior superior iliac spine, the ilioinguinal and iliohypogastric nerves pierce the transversus abdominus to lie between it and the internal oblique muscles. Spinal Anaesthesia is a form of regional anaesthesia involving injection of local anaesthetic into the subarachnoid space. Though this technique is waning in the developed world, it still remains the mainstay of anaesthesia in country like India. It is very useful in surgeries of lower abdomen or lower limbs and lasting for less than 2 hours. Majority of hernia surgeries are performed under spinal anaesthesia.

Material and methods:
The current work represents single institutional prospective comparative study conducted for the period of two years conducted in Surgery OPD, Operation Theatre and Surgical Ward.
The study was conducted at Dr.Hedgewar Rugnalaya which represents tertiary centre located in Aurangabad City, divisional place of Maharashtra, which serves a large population of the community of different socioeconomic levels. The study comprises of 100 patients who underwent Onlay Inguinal Mesh Hernioplasty. 50 cases were operated under Hernia Block and 50 cases under spinal anaesthesia. In this study, 50 cases under hernia block and 50 cases under spinal anaesthesia were carried out.

**Criteria for inclusion**

- a) Age between 40 years and 80 years
- b) Unilateral, reducible, uncomplicated Inguinal Hernias.

**Criteria for exclusion**

- a) Bilateral inguinal hernia.
- b) Obstructed / strangulated hernias.
- c) Morbid obesity.
- d) Uncontrolled diabetes, hypertension.
- e) Local skin disease.
- f) Allergy or hypersensitivity to local anaesthetics.

**Hernia Block (Ilioinguinal – Iliohypogastric Nerve Block Anaesthesia)**

With patient in supine position, the inguinal region was cleaned with spirit. The solution for the block was prepared in 20 ml syringes. 22G needle was used for administration of block. Inj. Hyaluronidase (1500 I.U.) was mixed with 20ml of Inj. Bupivacaine to improve tissue permeability. Hernia was completely reduced before institution of anaesthesia.

**Spinal Anaesthesia :**

With patient in sitting position, the lower back was painted and draped. Spinal anaesthesia was performed by the anaesthesiologist at L3-L4 or L4-L5 space with 23 G spinal needle by using Inj. Bupivacaine 0.5% heavy 3 – 4 ml.

**Results:**

Table 1: Age Distribution

<table>
<thead>
<tr>
<th>Age (Yrs.)</th>
<th>Hernia Block</th>
<th>Spinal Anaesthesia</th>
</tr>
</thead>
<tbody>
<tr>
<td>41 to 50</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>51 to 60</td>
<td>16</td>
<td>18</td>
</tr>
<tr>
<td>61 to 70</td>
<td>20</td>
<td>18</td>
</tr>
<tr>
<td>71 to 80</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>50</td>
</tr>
</tbody>
</table>

In our study, patients in the age group of 40 to 80 years were included. Of the 100 cases, 50 were operated under hernia block and 50 under spinal anaesthesia. The age distribution in both the groups was similar.
Patients were asked after surgery to rate their pain on a numerical pain intensity scale of 0 to 10. The results obtained were as follows:

There was significant difference noted between the pain experienced between the two groups 2 hours after surgery. Patients operated under hernia block had less pain post-operatively as compared to those operated under spinal anaesthesia. Patients were directly shifted to room/ward (except 5 patients in whom Inj. Ketamine / General Anaesthesia was needed) as no post anaesthesia care was required in hernia block.

There was significant difference noted between the pain experienced between the two groups 6 hours after surgery. Patients under hernia block had less pain as compared to those operated under spinal anaesthesia.

At 5% level of significance, there was no significant difference noted between the pain experienced between the two groups 24 hours after surgery.

Table 2: Mean pain experienced by two groups

<table>
<thead>
<tr>
<th></th>
<th>Mean Pain experienced by patients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hernia Block</td>
</tr>
<tr>
<td>During institution of anaesthesia</td>
<td>1.56</td>
</tr>
<tr>
<td>During Surgery</td>
<td>0.76</td>
</tr>
<tr>
<td>2 hrs. Post-op</td>
<td>0.24</td>
</tr>
<tr>
<td>6 Hrs. Post-op</td>
<td>1.56</td>
</tr>
<tr>
<td>24 Hrs. Post-op</td>
<td>1.18</td>
</tr>
</tbody>
</table>

Discussion:

Inguinal hernia may present with the chief complaint of inguinal swelling, pain or discomfort. These affect the routine day to day activities of the person. There is possibility of complications such as irreducibility, strangulation, obstruction, etc. The only definitive treatment of inguinal hernia is surgery. Inguinal hernia surgeries have a low complication / mortality rates but present with appropriate technical difficulties. The choice of anaesthesia depends
on the preference of the operating surgeon and the patient. The anaesthetic technique used must provide adequate analgesia as well as muscle relaxation in the inguinal region for the surgery to be performed.

Garavello et al⁴ reported 83% of intraoperative comfort under local anaesthesia. The discomfort occurs mainly due to hernia sac dissection, pulling of the cord and anxiety. Hernia block does not anaesthetize any bowel or intra-peritoneal tissue. Hence, these tissues need to be handled gently by the surgeon during surgery. We also noted pain and discomfort intraoperatively in 5 cases (10%). Additional sedative in the form of Inj. Ketamine 0.5 to 1 mg/kg was administered during the operation as necessary to allay anxiety or discomfort during procedure in 4 cases. 1 case was converted to general anaesthesia. 45 cases (90%) were satisfied with the analgesia and did not complain of any pain during surgery. In 1979 to 1982 comparative studies were done by Young D V of over 230 patients.¹ They report 13% of patients under hernia block and 7% patients under spinal anaesthesia had mild pain during the procedure. They concluded that patients had more discomfort during operation under hernia block than other anaesthesia but less postoperative wound pain, headache, nausea, difficulty in voiding, respiratory and urinary tract infections. Some studies report 99% satisfaction rates for local anaesthesia. These may be attributed to use of supplementary sedation in these studies by propofol or opioids.⁵,⁶ In one patient in hernia block group, conversion to general anaesthesia was required due to unsatisfactory surgical condition. A small conversion rate from local to general anaesthesia has been reported in literature.⁷

In spinal anaesthesia, patients need close monitoring during surgery. Incidence of hypotension following spinal anaesthesia is 10 to 40%.⁴ It is due to paralysis of preganglionic sympathetic fibres transmitting motor impulses to the peripheral vasculature. This leads to reduction of peripheral vascular resistance. This effect produces decreased venous return to the heart leading to decreased cardiac output which in turn leads to hypotension. Yilmazlar et al (2006) studied comparison of ilioinguinal-iliohypogastric nerve block versus spinal anaesthesia for inguinal herniorrhaphy.⁸ They concluded that there were statistically significant decreases in the mean pulse rate and arterial blood pressure in the spinal anaesthesia group. In our study hypotension was recorded in 8 cases (16%) in spinal anaesthesia group. Hypotension was corrected with appropriate administration of IV fluids. None of the cases in hernia block group recorded any intraoperative hypotension. No bradycardia was noted in any case of both the groups. Bradycardia and cardiac arrest are known rare complications of spinal anaesthesia. Intraoperative nausea and vomiting were complained by one patient in hernia block group and one patient in spinal anaesthesia group. Recovery room care was needed in only 5 cases under hernia block group (Supplemental Ketamine was given in 4 cases and 1 case was converted to general anaesthesia). Spinal anaesthesia group patient were monitored for 30 minutes after surgery in recovery room before shifting to the general ward/room. This can facilitate early discharge from hospital especially in day-care surgery.⁷

In our study, patients of hernia block had significantly longer duration of postoperative analgesia and lesser need for supplemental analgesics as the end of 6 hrs as compared to spinal anaesthesia. Song et al⁹ have reported similar results with 93% rate of good immediate postoperative analgesia with a significant reduction in need for analgesics.
Conclusion
From this study, we conclude that hernia block is a simple, safe and effective technique of anaesthesia to perform inguinal mesh hernioplasty in uncomplicated inguinal hernias.

References: