Polypropylene Suture Versus Skin Staples for Securing Mesh in Lichtenstein Inguinal Hernioplasty

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ABSTRACT

Objective: To compare polypropylene suture and skin staples for securing mesh in Lichtenstein inguinal hernioplasty in terms of mean operating time and postoperative pain.

Study Design: Randomized clinical trial.

Place and Duration of Study: Surgical Ward, Combined Military Hospital, Kharian, from August 2011 to February 2012.

Methodology: All individuals fulfilling inclusion criteria underwent elective Lichtenstein inguinal hernioplasty as admitted patients, under spinal anaesthesia and with aseptic measures. In group 1, during the operation, mesh fixation was done with 2/0 polypropylene suture and skin was closed with subcuticular 2/0 polypropylene suture whereas in group 2, the anchorage of mesh was done with skin staples and skin was closed with staples from the same stapler. Mean operative time and postoperative pain, assessed on a visual analog score, were compared between the groups.

Results: The overall postoperative pain was lower (p = 0.026) when staples were used to anchor mesh. Moreover, operative time was also lower (37.42 ± 2.69 minutes) in staple group versus (42.44 ± 2.55 minutes in polypropylene group).

Conclusion: Mean operating time and postoperative pain is less in securing mesh with skin staples as compared to polypropylene suture in Lichtenstein inguinal hernioplasty.

Key Words: Lichtenstein inguinal hernioplasty. Polypropylene suture. Skin staples. Mean operative time. Postoperative pain.

INTRODUCTION

Inguinal hernia, a common clinical problem, constitutes 73% of all external hernias.¹ Surgery is the treatment of choice for hernia in order to prevent complications.²³ Inguinal hernia repair is the most common operation undertaken in routine surgical practice with more than 100,000 inguinal hernia repairs performed in UK per year.¹ The importance of the postoperative disability period of hernia repair was brought to the attention of surgeons by Lichtenstein in 1966.⁴ The tension-free hernioplasty project was started at the Lichtenstein Hernia Institute in June of 1989 to decrease postoperative pain, recovery period and recurrence rate.⁵ The Lichtenstein hernioplasty consists of reduction of the hernia contents followed by reinforcement of the inguinal floor with a prosthetic mesh and creation of a new internal ring.⁶⁷ The standard way of securing the mesh in position on the posterior wall of the inguinal canal is with polypropylene sutures.¹²⁸ With recent advancement, a modified hernioplasty using skin staples for anchorage of mesh is under trial which may reduce operative time and decrease postoperative pain.³

A recent study compared the results of both methods of mesh fixation. It showed that the technique of mesh fixation with skin staples is as effective as conventional fixation with polypropylene sutures with an important added advantage of fewer complications.³ As inguinal hernia is a very common problem, new innovations in the surgical intervention are developing day by day in order to benefit the patients by reducing the operative time and postoperative complications.³⁹¹⁰ By anchoring mesh with skin staples in Lichtenstein inguinal hernioplasty the operating time as well as postoperative pain may be reduced, which is an important beneficial outcome for patients and will also decrease workload in the hospital.

The aim of this study was to compare polypropylene suture and skin staples for securing mesh in Lichtenstein inguinal hernioplasty in terms of mean operating time and postoperative pain.

METHODOLOGY

Patients aged 18 - 60 years having inguino-scrotal swelling (reducible, non-tender) were labelled as having inguinal hernia and were included in the study. Patients having complicated (irreducible, strangulated or obstructed) inguinal hernia, diabetes mellitus, chronic renal failure, bleeding disorders, immunocompromised, recurrent and bilateral inguinal hernia were excluded. Those who fulfilled the sample selection criteria were admitted in surgical ward for hernioplasty. Permission
from hospital ethical committee was obtained. A written informed consent was taken from every patient included in the study. A total of 266 patients with inguinal hernia were selected and randomized either to the polypropylene group or the staples group based on table of random numbers.

All the patients underwent elective Lichtenstein tension free inguinal hernioplasty in the operation theatre of CMH, Kharian as admitted patients, under spinal anaesthesia and aseptic measures. In group 1, during the operation, mesh fixation on posterior inguinal wall was done with 2/0 polypropylene suture and skin was closed with subcuticular 2/0 polypropylene suture whereas in group 2, the anchorage of mesh was done with skin staples and skin was closed with staples from the same stapler. Then the wound was washed with pyodine and aseptic dressing was applied. Patients were given Injection Augmentin 1.2 gm at the time of induction of anaesthesia and tablet Brufen as required. Operating time (in minutes) of every operation was recorded for comparison among the groups. Time was measured in minutes from start to beginning of mesh repair, beginning of mesh repair to end and total time for operation. All patients were discharged on the 1st postoperative day and were reviewed on 3rd day post-operatively to record the pain. Postoperative pain perception was measured using a visual analog score (VAS) card on 3rd postoperative day and was graded as nil, mild, moderate and severe. Data for each patient was recorded on a patient's proforma. Follow-up was ensured by taking contact numbers of patients. Control of bias and confounding factors was done by strictly following the exclusion criteria.

All the data was entered in computer software Statistical Package for Social Sciences (version 14.0). Descriptive statistics were applied to summarize the data. Mean and standard deviation (±SD) was calculated for all the quantitative variables i.e. age and operating time. Frequency and percentages were calculated for qualitative variables i.e. pain. Comparison of pain was done using chi-square test. Comparison of operating time was done using independent sample t-test. P-value of < 0.05 was considered as significant.

RESULTS

A total of 266 patients were recruited for study after careful scrutiny using above mentioned inclusion and exclusion criteria. Quantitative variables included in the study were age and operating time. A qualitative variable was pain. Mean age in polypropylene group was 48.99 ± 14.27 years and in staple group was 46.37 ± 14.12 years with the average age in both groups was 47.68 ± 14.23 years. Mean operating time from start to beginning of mesh repair (a) in polypropylene group was 25.46 ± 2.47 minutes whereas in staple group was 25.87 ± 1.99 minutes, mean operating time from beginning of mesh repair to end; (b) in polypropylene group was 16.99 ± 1.08 minutes whereas in staple group was 11.56 ± 1.95 minutes. Mean total operating time (a+b) Table I) in polypropylene group was 42.44 ± 2.55 minutes whereas in staple group was 37.44 ± 2.69 minutes (p < 0.001). On 3rd postoperative day, 31 (23.3%) in polypropylene group had no pain, 68 (51.1%) had mild pain, 18 (13.5%) had moderate pain and 16 (12.0%) had severe pain (Figure 1). On 3rd postoperative day in the staple group, 39 (29.3%) had no pain, 79 (59.4%) had mild pain, 9 (6.8%) had moderate pain and 6 (4.5%) had severe pain (p = 0.026).

### Table I: Operating time comparison.

<table>
<thead>
<tr>
<th>Group</th>
<th>Number</th>
<th>Mean</th>
<th>Std. deviation</th>
<th>p-value</th>
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<tbody>
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<td>25.462</td>
<td>2.46966</td>
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<tr>
<td>Staple Group</td>
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<td>25.8496</td>
<td>1.99049</td>
<td></td>
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<tr>
<td>Operating time (b)</td>
<td>Polypropylene Group</td>
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<td>16.9850</td>
<td>1.08002</td>
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<tr>
<td>Staple Group</td>
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<td>11.5639</td>
<td>1.95151</td>
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<tr>
<td>Operating time (a+b)</td>
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<td>42.4361</td>
<td>2.55353</td>
</tr>
<tr>
<td>Staple Group</td>
<td>133</td>
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</table>

DISCUSSION

Inguinal hernia repair is a common disorder affecting 5% of the male population. Edward Bassini originally described the basis of the current open method of inguinal herniorrhaphy more than 100 years ago. Many modifications have been made to this procedure in the interim, with varying degrees of efficacy. Lichtenstein described the tension free inguinal hernia repair with the help of prosthetic mesh. Originally, the mesh is fixed on the posterior wall of inguinal canal with the help of polypropylene 2/0 suture. But Quality of life has increasingly been a matter of consideration in the assessment of medical, and above all, surgical procedures. In inguinal hernia repair, several factors of postoperative quality of life, such as pain and recovery, have recently been assessed. A new modification in
the repair of inguinal hernia has been developed in which prolene mesh is being fixed on the posterior wall of inguinal canal with staples instead of polypropylene suture. A recent study compared the results of both methods of mesh fixation. There was no significant difference in operating time when staples are used (mean 56 ± 17 minutes) for polypropylene group versus 50 ± 16 minutes for staple group. However, postoperative pain was reduced when staples were used to fix the mesh (66% for polypropylene group versus 51% for staple group). This study showed that the technique of mesh fixation with skin staples is as effective as conventional fixation with polypropylene sutures with an important added advantage; fewer complications.

The overall postoperative pain was lower (p = 0.026) when staples were used to anchor mesh in Lichtenstein inguinal hernioplasty. Moreover, operative time was also reduced once staples were used instead of polypropylene suture to fix mesh in inguinal hernioplasty. Interpretation of the results shows that anchoring mesh with staples in Lichtenstein inguinal hernioplasty is superior as compared to fixation with polypropylene suture.

Inguinal hernia is one of the commonest surgical problems encountered in daily surgical outpatient department and inguinal hernia repair is the commonest operation done in the elective surgical operation list. Recently, there is a growing interest in surgeons about the modification of surgical procedures for the benefit of their patients. Apropos, methods are designed to modify inguinal hernia repair to decrease operating time as well as postoperative complications like pain, surgical site infection and haematoma and seroma formation. This study was designed to compare polypropylene suture and skin staples for securing mesh in Lichtenstein inguinal hernioplasty in terms of mean operating time and frequency of postoperative pain. Mean operating time leads to a rapid turnover of the patients. Moreover reduced operating time has a direct implication on the working capacity of the surgeon i.e. efficiency of the surgeon is increased. Postoperative pain is reduced if staples are used to anchor mesh in inguinal hernioplasty. Decreased pain reduces stress on the patients and hastens their recovery. Quick recovery leads to early return to work and reduced work loss days. This is an important implication not only on the natural well-being but also on the monetary aspect of the patients.

CONCLUSION

Anchorage of prolene mesh with staples made the procedure quicker for surgeons and less painful for the patients.

Disclosure: It is a dissertation based article.

REFERENCES