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Original Research Article

Prospective study on clinical outcomes of Lichtensteins tension free inguinal hernioplasty under local anaesthesia

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ABSTRACT

Background: Hernia may be generally defined as a protrusion of viscus or part of a viscus though an abnormal opening in the walls of its containing cavity. The Greek word 'hernia' means an offshoot, a budding or bulge. But the Latin word 'hernia' means a rupture or tear. The most important principle in reconstruction surgery is to avoid tension when restoring the muscular or elastic structures. The modern biologically based concept for repair of groin hernia, acquired during adult life, is application of a patch, avoidance of tension and use of local, spinal or epidermal anaesthesia.
Methods: Present study is a Prospective study conducted in the Department of General Surgery in Sri Guru Ramdas Medical College and Hospital. Patients admitted in wards with inguinal hernia from General Surgery out-patient Department were selected for study. The study consisted of 60 patients between 15 to 74 years; The study period is from April 2015 to September 2016. The main aim and objective of any hernia repair is to avoid any recurrence and also acceptability to the patient in terms of pain, discomfort, other complications during follow up and obviously in terms of cost- effectiveness of repair.
Results: The present study comprises 60 cases of inguinal hernia who were admitted in the wards of Department of General Surgery in the Sri Guru Ramdas Institute of Medical sciences and research. The study was carried out during span of 1½ years. All of these cases were studied prospectively, and results were analysed from various angles. Among total 60 cases in this study, maximum cases belonged to age group 35-44 years ;15 (25%) and minimum to age group 65-74 years 5 (8.3%). Case distribution as per type of hernia, it was observed that among total 60 cases 34 (56.67%)had inguinal hernia and rest 26 (43.3%) had inguino scrotal hernia. Most 0f the cases had right sided hernia 35 (58.33%), left sided hernia was seen only in 23 cases (38.33%) whereas bilateral hernia was present in 2 (3.33%).
Conclusions: From our results of observations in the study we can conclude that-The methods of Lichtenstein's tension free inguinal hernioplasty under local anaesthesia is safe, simple, effective, economical, and without any side effects such as hypotension, nausea, vomiting, urinary retention, and spinal headache.

Keywords: Hernia, Hernioplasty, Local anasethesia

INTRODUCTION

Hernia may be generally defined as a protrusion of viscus or part of a viscus though an abnormal opening in the walls of its containing cavity. The Greek word 'hernia' means an offshoot, a budding or bulge. But the Latin word 'hernia' means a rupture or a tear. Casper Stromayr in 1559 Classified Inguinal Hernia into direct and indirect varieties. But this classification of direct and indirect inguinal hernia is meaningless in the terms of modern surgical biology, as one can be converted to other by simple traction or mere elimination of the inferior epigastric vessels. But the classification of congenital and

acquired is still very much in practice. The congenital variety is simple protrusion of the patent processus vaginalis. But it is not simple an anatomical defect as more than 25 percent of men enter adult life with a patent processus vaginalis (Sac), but with no herniation. This indicates an ill- understood defect in the posterior wall of inguinal canal which leads to herniation. On the other hand, in the acquired variety the derangement in the collagen metabolism is mainly responsible for herniation. The metabolic derangements may either be increased collagenolysis over the amount of synthesis or the production of faulty, collagen with less hydroxy proline. (Read R. C. et al. in 1972).[1]

During exertion the arching fibres of transversus abdominis are approximated to the inguinal (pouparts) ligament and this reinforces the fascia transversalis. When the buttressing action of musculo-tendinous barrier fails the herniation occurs. There is no point in reconstructing the normal anatomy of the canal floor, as the mere presence of hernia proves the deficiency of the canal floor (Peacock E. E. Jr. 1989).[2]

Fascia is mere connective tissue with little intrinsic strength. The collagen rich aponeurosis is the structure which provides the support to the abdominal wall, physiologic restoration of the canal floor is advocated in most techniques since Bassini (1884), by in corporating the musculo-tendinous arch, rather than anatomic repair by relying mainly upon fascia transversalis repair and high ligation of sac.[3]

The physiologic restoration is justifiable in the congenital variety and to be liberal, in anatomic defects like dilatation, paralysis and laceration. But there is no justification in attempting physiologic restoration in the acquired type where the underlying pathology is the metabolic defect.

The most important principle in reconstruction surgery is to avoid tension when restoring the muscular or elastic structures. An old saying beautifully elaborates this principle. 'If it is hard, it is wrong' (Peacock EE. Jr. 1989). Attempting to suture the mobile muscular side to the fixed, immovable cooper's ligament is against the principle of reconstructive surgery. Pulling muscular tissue to an immovable structure is not only physiologically naïve and structurally destructive but also produces pain and discomfort during movement in the follow up period.[4]

On the other hand, a patch between movable structures fulfils the principles of reconstructive surgery. A patch is thus mechanically reasonable, structurally sound and elegantly simple. The modern biologically based concept for repair of groin hernia, acquired during adult life, is application of a patch, avoidance of tension and use of local, spinal or epidermal anaesthesia. So that the result can be tested intra operatively. Very little post- operative discomfort such as uncomplicated micturation and early restoration to normal routine and long-term recurrence rate approximating zero, can make this procedure as a method of choice in hernia repair. Of the patch materials synthetic materials like poly propylene mesh is most suitable, because of its pliability and its inert nature.

METHODS

Present study is a Prospective study conducted in the Department of General Surgery in Sri Guru Ramdas Medical College and Hospital. Patients admitted in wards with inguinal hernia from General Surgery out-patient Department were selected for study. The study consisted of 60 patients between 15 to 74 years; The study period is from April 2015 to September 2016.

The main aim and objective of any hernia repair is to avoid any recurrence and also acceptability to the patient in terms of pain, discomfort, other complications during follow up and obviously in terms of cost- effectiveness of repair. One of the most important pillar of hernia repair stands on antisepsis which was brought about by Lister. The other one is repair of posterior wall of inguinal canal, which ever may be method. This unique idea was given by Bassini and thus revolutionized the surgery of hernia.

The present study aims to evaluate the following points

- Assessment of clinical outcomes of tension- free Lichtenstein's method under local anaesthesia in terms of post- operative pain, return to work, recurrence rate and complications,
- To assess the acceptance of the methods by the patient.

Specific objectives of this study

- To develop skills for the surgeons for inguinal nerve block for performing painless surgical procedure
- To achieve low recurrence rate and complication of inguinal hernioplasty under local anaesthesia.

These 60 patients had complaints of groin swelling either in right side or left side groin or both sides. Most of them were reducible.

Inclusion and exclusion criteria

All adult patients suffering from Inguinal Hernia were included in study. Children and paediatric age groups were excluded because they do not cooperate local anaesthesia repair under local anaesthesia. All cases of obstructed and strangulated hernias are also excluded. Patients unfit for any type of surgery such as terminal malignancy, very old age, advanced diabetes and renal failure where co-morbid factors present were also excluded.

After admission every patient was thoroughly examined clinically. In every patient cough impulse in the groin

swelling was noticed. In every patient with reducible groin swelling deep ring occlusion test was done and size of the deep ring was assessed. By deep ring occlusion test, type of hernia, i.e. direct or indirect variety was assessed clinically. In patients with associated complaints of narrowing of stream of urine and chronic constipation per rectal examination was done to evaluate the prostatic size and other pathology in rectum and anal canal.

All patients with hernia without obstructive or strangulative features were investigated by following investigations from out-door as a routine procedure

- Estimation of haemoglobin, total count, differential count and Erythrocyte sedimentation rate
- Fasting and post prandial blood sugar estimation
- Serum urea, and in patient with features of prostatism, serum creatinine
- Routine examination of stool
- Routine examination of urine
- Chest X-ray PA view
- Electro-cardiogram advised in patients with hypertension and in patients over the age of 40 years and Echo cardiography whenever necessary.

After receiving all reports, the patients were admitted in the ward after anaesthetic fitness from anaesthesia OPD and operations were a managed on scheduled dates.

In this study all patients were subjected to local anaesthesia. This helps to test the repair of posterior wall per- operatively.

Lichtenstein's tension free Hernioplasty done under local anaesthesia with an average of 45 ml of mixture of 1% lidocaine and 0.5%. Bupivacaine with or without 1/200, 000 epinephrine for a unilateral hernia repair.

Sedative drugs were given by the surgeon, or preferably by an anaesthetist as "conscious sedation" via infusion of rapid short acting, amnesic and anxiolytic agents such as propofol, midazolam or diazepam, reduce he patient's anxiety. This also reduces the amount of local anaesthetic agents required, particularly bilateral inguinal hernia repair. The polypropylene mesh it is synthetic polymer. Monofilament fibres of polypropylene are interlocked and knitted to prepare the mesh form. The thickness is 0.69 mm. As the mesh fibres are interlocked there is no fear of unravelling. Also, mesh can be cut to any size and shape without concern for its orientation of fibres. The softening point of polypropylene is about 140ºC and melting point is about 335 ºC. So, it can easily be autoclaved and reused, the strength of the mesh is 17.5 kg/cm^2 and the mesh has a two-way stretch.

The foreign body reaction to polypropylene is less than that of nylon or dacron and equals to that of Teflon. The fibroblast infiltration into the interstices are more in polypropylene mesh with better bondage to the surrounding tissue than Teflon.

The polypropylene is strong monofilament, inert and readily available, it is unable to harbour infection, is very thin and porous, its interstices become completely infiltrated with fibroblast and remain strong permanently, it is not subjected to deterioration or rejection and it cannot be felt by the patient or surgeon post operatively. With the use of this mesh, it is now possible to eliminate formal reconstruction of the canal floor with its concomitated anatomic distortion. Also suture line tension is completely avoided.

The patients operated on under local anaesthesia was allowed unrestricted movements with in twelve hours if there were no other contra indications. The first change of dressing was done after the 48 hours of the operation in a strict aseptic manner to look far early post-operative complications like seroma and haematoma. The second change of dressing was done 72 hours after operations in a strict aseptic manner to look for any wound infection. If wound is healthy, the patient is discharged on that day, i.e. 3rd post-operative day. The patient was discharged after full local and general clinical examination. The patient was advised to come SOPD on 7th post-operative day for stitch removal.

The patient was discharged with advice to attend follow up clinic at surgical out-patient department after 1 week, 4 weeks and 2 months and there after every month up to 6 months of discharge. The patient was also told to attend OPD if any complication arises at any time between the scheduled dates. During follow up the patient was examined thoroughly for any local minor complications like stitch abscess or major problem like recurrence. During post-operative convalescent period the patients were allowed restricted physical labour and limited weight bearing for period of six weeks and unrestricted physical labour after six weeks.

RESULTS

The present study comprises 60 cases of inguinal hernia who were admitted in the wards of Department of General Surgery in the Sri Guru Ramdas Institute of Medical sciences and research. The study was carried out during span of 1½ years. All of these cases were studied prospectively, and results were analysed from various angles. Among total 60 cases in this study, maximum cases belonged to age group 35-44 years; 15 (25%) and minimum to age group 65-74 years 5(8.3%).

Case distribution as per type of hernia, it was observed that among total 60 cases 34 (56.67%)had inguinal hernia and rest 26 (43.3%) had in guino scrotal hernia. Most 0f the cases had right sided hernia 35(58.33%), left sided hernia was seen only in 23 cases (38.33%) whereas bilateral hernia was present in 2 (3.33%). Table 1 below shows distribution of cases based on type of hernia on clinical examination. among total patients, 46 (76.6%) had indirect, 11 (18.33%) had direct and remaining 2 (1.67%) had combined type.

Table 1: Type of hernia on clinical examination.

Types	Number	%
Indirect	46	76.67
Direct	11	18.33
Combined	2	1.67
Recurrent	2	3.33
Total	60	100

The distance between inguinal ligament and transversus abdominis arch line was less than 0.5 cm in 5 cases. In 14 cases this gap was greater than 2 cm. In 41 patients it was between 0.5 cm and 2 cm.

In 2 patients when there was recurrent herniation the normal anatomy was distorted and a punched-out gap were found in previous repair line: The maximum average gap was 2.3 cm and average minimum gap was 0.3 cm. Mean was 1.37 cm.

Table 2: Gap between inguinal ligament and transversus arch.

Gap (cm)	No. of cases	%
< 0.5	5	8.33
0.5 - 2	41	68.33
> 2	14	23.33
Total	60	100

The deep ring was assessed per- operatively in all cases. In 17 patients the deep ring was found to be of normal size. In 33 patients the deep ring was found to be widened marginally (of one finger breath) and in 10 patients the deep ring was very much widened i.e. two fingers breath and more.

Table 3: Per-operative assessment of size of deep inguinal ring.

Size	No. of cases	%
Normal	17	28.33
Marginal	33	55
Wide	10	16.67
Total	60	100

Table 4: Severity of post-operative pain (within 48 hours).

Type of pain	No. of cases	%
Mild	45	75
Moderate	10	16.67
Severe	5	08.33
Total	60	100

Severity of pain was looked very precisely and categorized through Wong Bakers Faces Pain Rating Scale into Mild (0-3), Moderate (4-5) and Severe (6-10). This pain score was performed at immediate post-operative period within 48 hours, at 1 week and after 1 week.

Table 5: Pain score at 1 week.

Type of pain	No. of cases	%
No pain	45	75
Mild	12	20
Moderate	3	5
Severe	0	0
Total	60	100

At 1 week moderate to severe pain occur due to wound infection and neuralgia. In long- term pain occurred due to nerve entrapment. Complication of this type of hernia repair were categorized into two groups one at 1 week and other > 1 week.

Table 6: Early complication < 1 week.

Type of complication	No. of cases	%
Retention of Urine	5	8.33
Infection	4	6.67
Seroma	3	5
Haematoma	2	3.33
Scrotal swelling	2	3.33
Neuralgia	3	5
Induration	2	3.33
No complication	39	65
Total	60	100

Table 7: Late complications > 1 week.

Type of complication	No. of cases	%
Scar tenderness	0	0
Neuralgia	2	3.33
Wound dehiscence	1	1.67
Testicular atrophy	0	0
Recurrence	0	0
No complication	57	95
Total	60	100%

Table 8: Per operative nyhus type of hernia.

Type	No. of cases	%
Type I	10	16.67
Type II	28	46.67
Type III	20	33.33
Type IV	2	3.33
Total	60	100%

DISCUSSION

Considering the results obtained in this study which are depicted in different tables, a detailed discussion could be held from different view-points to arrive at a final evaluation of Lichtenstein's tension free inguinal

hernioplasty under local anaesthesia employed in this study. Majority of our patients were in the age group of 35-44 years (25%). Though this result does not tally with Abrahamson, where it is found that incidence varies from 5- 8% in patients of aged 35-44 years and about 45% at the age of 75 years. Mean age of presentation in present study is 40.78 years and the youngest member was 18 years old and oldest member presented with at the age of 73 years. Though Western literatures shows male to female ratio of incidence of hernia to be 12:1, but in our present study we have not encountered any single female patient. It can be explained by the fact that present study material was not too large. Most common presenting symptom in present study was reducible swelling at the groin, found in 34 cases (56.67%) and the next most frequent symptom was a reducible swelling of the root of the scrotum found in 26 cases (43.33%).

In present study during clinical examination of patients we found right sided hernias in 35 cases (58.33%), left sided hernias in 23 cases (38.33%) and bilateral in 2 cases (3.33%). Palumbo and Sharpe et al in 1971 had shown in their study with incidence of right sided hernia was 48.9% and left sided 37.9% and bilateral in 3.2% cases.[5] This discrepancy can be attributed to our small series and reluctance of the age's person about their problem. Our present study we confirmed the type of hernia during operation. It revealed 46 cases (76.67%) with inguinal hernia, 11 cases (18.33%) with direct hernia, 1 case (1.67%) combined variety and 2 cases (3.33%) recurrent variety. This data closely simulates that data given by Palumbo and Sharpe in 1971 where the indirect was 64.7% and direct 19.2% and others 16.3%.[5]

In present study we measured the distance between inguinal ligament and transverses abdominis arch. It revealed that gap was less than 0.5 cm in about 8.33% cases between 0.5-2 cm 68.33% cases and more than 2 cm in 23.33% cases. These figures are very much compatible with those stated by Condon et al in 1964.[6] According to him almost 70 % of cases the gap was between 0.5 cm to 2 cm, in 15% cases it was more than 2 cm and 11% cases it was less than 0. 5 cm.

In present study 60 patients with hernias were repaired by this tension free method under local anaesthesia. We classified the hernia per- operative in to the Nyhus classification, 10 cases 16.67%) had Type I hernia 28 cases (46.67%) had type II hernia 20 cases (33.33%) had Type III hernia and 2 cases (3.33%) had Type IV hernia. Complication rates ranges from open inguinal herniorrhaphy vary from 1 to 26% with most reports ranging from 7% to 12% as report finding of Mac fadyen.[7] Main immediate post-operative complications in hernia repair are, Urinary retention, Scrotal swelling, Wound infection, Haematoma, Seroma, Neuralgia, Induration.

In present study 21 cases (35%) had early complications of which, 2 cases (3.33%) had retention of urine, 4 cases (6.67%) had wound infection, 3 cases (5%) had seroma, 2 cases (3.33%) had haematoma, 2 cases (3.33%) had scrotal swelling, 3 cases (5%) had neuralgia and 5 cases (8.33%) had induration.

Incidence of wound infection was 6.67% (in 4 cases). Desarda in his series of 40- cases found mild skin infection with only 4 cases (1%).[8] Wantz in his 4114 hernioplasties showed minor wound infection in 0.58% cases.[9,10] Our result was not so much discouraging when compared with the Western series inspite of our economically poor patients profile having poor personal hygiene. Incidence of would induration is 8.33% (5 cases). Wound induration was attributed to the combination of wound haematoma and oedema; probably has some relation with the extent of dissection required for the repair. In Western literature incidence was found to be 5.2% as reported by Ponka and Desarda also found it to be 1.5%.[8]

No recurrence has yet occurred in 1½ years follow up. This 1½ years period is very much insufficient to judge about the efficacy of any method and also very short to comment about the recurrence. When considering recurrence, a long period of follow up is required because 50% of recurrence do not appear for five or nine years after the initial surgery, and 20% may not be apparent for 15-25 years. Early recurrences in first few years are the result of failure on the part of the surgeons and technical failure (technique, tension, missed hernia, infection etc). Late recurrence is usually owing to tissue failure. Repeated recurrences or re recurrences can be the result of disorder of collagen production.

In a Cochrane database review in 2001 of open mesh versus open non- mesh repair, the researchers concluded. "There is evidence that the use of open mesh repair associated with a reduction in the risk of recurrence between 50% and 75%. They also argued that reduced hernia recurrence of around 30-50% was related to the use of mesh rather than the method of mesh placement. 2 patients (3.33%) presented with urinary retention in the evening of operative day. That patients passed urine spontaneously with provocative stimulus or change of posture.

Incidence of scrotal swelling 3.33% (2 cases). It might be related with narrowness of newly constructed rings. The Western literature showed incidence with 2.6% as reported by Rydell though Desarda noticed it to be only 0.25%.[11] In present study late complication occurs in 2 cases (3.33%) suffering from neuralgia due to nerve entrapment and 1 case (1.67%) of wound dehiscence occurs in a patient suffering from diabetes mellitus. Patient treated with regular dressing and discharged at 10th post-operative days after giving the secondary suture.

In Table 7 severity of post-operative pain (within 48 hours) is recorded. Most of the patient suffering from mild degree of pain 45 cases (75%) and 10 cases

(16.67%) moderate degree of pain and only 5 cases (8.33%) suffering from severe degree of pain. Mild to moderate degree of pain is responded by use of oral paracetamol or oral or parenteral NSAIDS. Severe degree pain requires injectable form of opioids or tramadol.

In present study acceptance of the methods by the patient is also studied. It is found that it is well accepted in older age group (55-74 years) (91.67%) and poorly accepted (45.45%) in younger age group (15-34 years) because younger patient is very much apprehensive about local anaesthesia and post-operative pain. Post herniorrhaphy chronic groin pain, defined as pain that persists after the normal healing process has occurred-typically 3 months after surgery. It is most often a result of nerve injury sustained during improper dissection. Incidence appears to be lower with mesh repair than with non- mesh repair. Chronic pain is arguably a more important determinant of a successful inguinal hernia repair than peri-operative pain.

It is sometimes a debilitating complication for the patient and a difficult problem for the surgeon to treat. In multivariate logistic analyses, severe pre-operative groin pain, and presence of post-operative complications such as infection or haematoma were found to independently predict post-operative inguinal pain in a statistically significant manner. (P=0.001 and P=0.003, respectively). A double blinded, randomized controlled trial to investigate the effects of prophylactic ilioinguinal neurectomy follow tension free mesh repair of inguinal hernia. The finding demonstrated that the incidence of chronic groin pain at 6 months was significantly lowered compared with nerve preservation group (8% versus 28.6%, P=0.0008).

Advantage of this method

This new concept permit hernia repair without distortion of normal anatomy and any suture line tension. This operation is done under local anaesthesia. So, this operation is safely applied to the patients, who unfit for general anaesthesia or spinal anaesthesia. Due to use of local anaesthesia if allowing intra operative testing, prompt return to unrestricted activity and recurrence rate is negligible. Finally, the technique is simple, rapid, relatively less painful, safe and cost- effective in long term basis.

CONCLUSION

From our results of observations in the study we can conclude that:

- The methods of Lichtenstein's tension free inguinal hernioplasty under local anaesthesia is safe, simple, effective, economical, and without any side effects such as hypotension, nausea, vomiting, urinary retention, and spinal headache
- Open tension free inguinal hernioplasty performed under local anaesthesia allows the patient's immediate mobilization, cost effective, early return to of work and patients discomfort of a minimum level and uniformly low recurrence rate
- Excellent results from the Lichtenstein's open tension free operation are less dependent on the experience of the surgeon, an indication of the simplicity of the operation and short learning cure. The same technique can be safely being applied to all inguinal hernias, indirect and direct, as well as recurrent hernias
- Inguinal hernioplasy and in those operation where pain due to visceral origin is minimum and where profound muscle relaxation is not required, local infiltration anaesthesia is beneficial and becoming popular.

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