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OPEN TRANSINGUINAL PREPERITONEAL HERNIA REPAIR VERSUS LICHTENSTEIN'S HERNIA REPAIR: A COMPARATIVE STUDY IN SMCH, SILCHAR.

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ABSTRACT

INTRODUCTION: In Transinguinal preperitoneal mesh repair, the preperitoneal space can be accessed through the deep inguinal ring or through the medial inguinal defect by incising the transversalis fascia. The avascular pre-peritoneal space is physiologically and bio-mechanically suitable for placement of the mesh as it is an avascular zone and during ingrowth no scar tissue will implicate the nerves or the cord in the long term. The intra-abdominal pressure along with the forces of abdominal muscles helps to keep the mesh in place. In comparison to other techniques, this might decrease the amount of post operative pain and accelerate the return of the patient to his normal daily life.
MATERIALS AND METHODS: Some 100 cases who underwent elective hernioplasty were randomly divided into two groups-TIPP (Transinguinal preperitoneal mesh repair) and LR (Lichtenstein's repair). Both the groups were compared on the basis of operation time, length of hospital stay, postoperative pain, return to normal activity, postoperative complications.
RESULTS: The duration of operation was more in the TIPP hernia repair group. Duration of hospital stay was almost similar in both the groups but the average time of return to sedentary work after the operation was earlier in TIPP hernia repair group. During the early post operative period, most of the patients complained of mild to moderate acute pain which was noted to be more in LR group as compared to TIPP hernia repair group ($p<0.05$). In the long term follow-up also, the number of patients complaining of mild chronic pain were more in the LR group, although the difference was not statistically significant ($p>0.05$).
CONCLUSION: Open preperitoneal approach can be considered better than anterior Lichtenstein's repair approach in terms of acute pain, and duration of stay, difference with respect to peri-operative complications and post-operative scrotal/cord oedema and late wound induration and loss of sensation. But, there was no statistically significant difference in chronic pain in both groups.

INTRODUCTION:

Hernia is derived from the Latin word for 'rupture'.[i] Inguinal hernia repair is one of the most frequently performed surgical operations. There has been an evolution in different approaches. Lichtenstein tension-free mesh repair (anterior approach) is still the most widely done hernia surgery in India. The strength of the transversalis fascia is reinforced by addition of prosthesis deep to it[iii]. Laparoscopic hernia repair which approaches the hernia through a preperitoneal approach is increasingly becoming popular, but, has the disadvantage of having a long learning curve, where dissection becomes demanding in case of large hernias and also high cost associated with the procedure. Transinguinal open preperitoneal approach avoids all the above disadvantages while retaining the advantages of preperitoneal mesh repair.

Chronic pain is defined by the International Association for the Study of Pain as 'any VAS [visual analogue scale] score above zero which lasts for more than three months'.[iv] Chronic pain may be caused by nerve damage during surgery, or stretching or suturing. It may also be related to the position of the mesh in the inguinal canal. Continuous chronic pain is described by patients as an ongoing awareness of pain.

Transinguinal preperitoneal (TIPP) hernia repair with soft mesh combines the safe anterior approach with a preperitoneal sutureless mesh position, by using the deep ring as an entrance to the preperitoneal space. This open and sutureless technique is associated with a short learning curve and lower costs than the Laparoscopic TEP technique. Hypothetically, TIPP may be associated with less chronic postoperative pain than Lichtenstein's technique.

AIM: The aim of the present randomized controlled study was to compare the Transinguinal preperitoneal hernia repair (TIPP) to Lichtenstein's hernia repair(LR) procedure, in patients with unilateral inguinal hernia.

MATERIALS AND METHODS:

This randomised controlled trial was conducted in the Department of General Surgery, Silchar Medical College and Hospital, Silchar for a period of one and half years from June, 2018 to November, 2019.

The patients were randomized into two groups of TIPP and LR constituting of 50 cases in each group.

Technique: Both the groups were operated under spinal anaesthesia. Lichtenstein's repair was done according to established techniques as per standard protocols and precautions.

Incision of TIPP is same as that of LR. The iliohypogastic and ilioinguinal nerves are identified and retracted from the operative field. The posterior sheet of the transversalis fascia should be opened at the level of the dilated deep inguinal ring to enter the space of Bogros. From that moment on, the epigastric vessels will be retracted softly upwards. After palpation of both Cooper's ligament and pubic bone to ensure the dissection will be done in the right avascular preperitoneal space towards the space of Retzius. By doing so, most of the dissection medially will be performed bluntly. The index finger can now be introduced medially performing further dissection, first cranially, leaving the preperitoneal fat attached to the peritoneum. The fatty tissue is then swept off from the iliopubic branch of iliac bone, the pubic symphysis, the rectus muscle and the transverse muscle in succession, thus enlarging the preperitoneal space to accommodate the mesh.

The mesh is introduced in the direction of the pubis, upto the

tendon of the rectus muscle. Check medially that there is sufficient overlap of pubic tubercle and on the lateral side that there is flat mesh deployment towards the iliac spine.

Operative time was calculated from the incision to complete closure of the wound. Post-operative pain (by using a VAS system from 0-10) and other complications like wound induration, scrotal/cord oedema, surgical site infection, loss of sensation, recurrence were assessed at Day 03 and Day 07, at 1 month, 6 months and 1 year.

Complications were observed intraoperatively and postoperatively in terms of wound infection, ileus, intra-abdominal abscess and visceral or vascular injury, injury to nerves.

The patients were discharged when tolerated oral feed and deemed fit and was asked to come for regular follow-up on 7th day and then at 1, 6, 12 months .

Conditional Probability, t-test for two independent sample/ Median test, z- test, Chi-square test, Histogram with super imposed normal curve & related techniques will be used for the analysis. Statistical software (SSPS, Prism) were utilized for this study. Statistically significant difference in findings was considered when p-value was <0.05.

Steps of Transinguinal preperitoneal repair and Lichtenstein's repair:

Figure1 Sac dissected from cord and opened

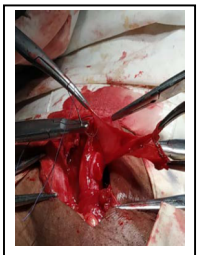


Figure2 Purse string suturing followed by excision of the sac

Figure3 Placement of mesh in the preperitoneal space

Figure4 Creation of deep ring by mesh

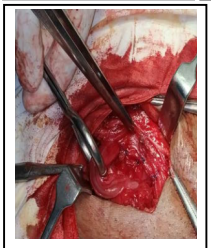


Figure5 Closure of fascia transversalis

Figure6 Lichtenstein onlay patch.

RESULTS :

Age and sex of both groups were comparable. Mean operative time was 46.36 mins for TIPP and 39.84 mins for LR group.

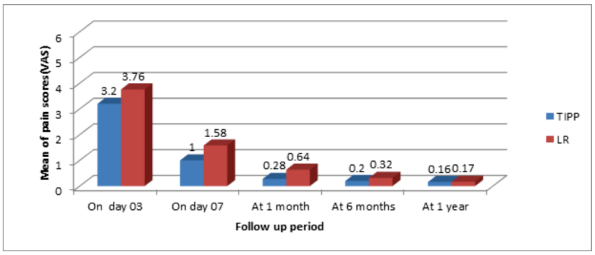
Duration of hospital stay was almost similar in both the groups but the average time of return to sedentary work after the operation was earlier in TIPP hernia repair group (12.32 days) than in Lichtenstein's repair group (13.10 days) which was statistically significant (p=0.0025). (Table 1)

It was observed that the patients who had peri-operative nerve injury complained of loss of sensation in the follow up period.

TABLE 1 :

	TIPP	LR
Duration of operation	43-51 min (46.36 min)	36-44 min (39.84min)
Length of hospital stay	3.58 days	3.64 days
Return to sedentary work	12.32 days	13.10 days
Injury to peritoneum	5	0
Injury to vessels/nerves	6(1/5)	2

During the early post operative period, most of the patients complained of mild to moderate acute pain on Day 03 and Day 07 in both TIPP hernia repair and LR group. But VAS score was noted to be more in LR group as compared to TIPP hernia repair group which was statistically significant in these two days (p<0.05). During the 1 month follow up period, there was mild pain, mostly exacerbated on exertion. During the 6 month and 1 year follow up period, there was no to minimal chronic pain in both the groups.



In the initial post operative period, the scrotal/cord oedema and wound seroma were found to be occurring more in the LR group as compared to TIPP hernia repair group, which subsided in most of the patients by 1 month of surgery. (Table 2)

There was mild increase in the number of patients having wound induration especially in the LR group by 6 months and one year follow up which was statistically significant (p<0.05).

The loss of sensation was found to be more in the LR group than the TIPP hernia repair group all through the follow up period but was not significant. (p>0.05)

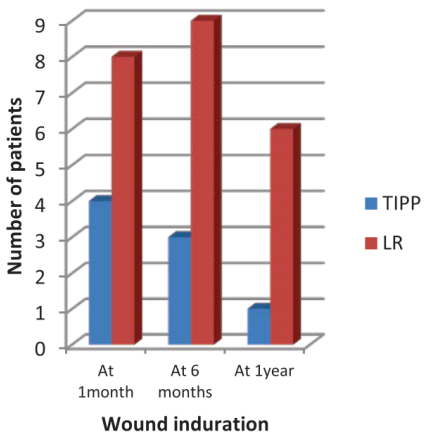


TABLE 2:

	TIPP	LR
Post-operative day 03		
Wound seroma	2	4
Scrotal/Cord oedema	3	5
Surgical site infection	2	3
Loss of sensation	5	8
Post-operative day 07		
Wound seroma	1	1
Scrotal/Cord oedema	1	1
Surgical site infection	0	1
Loss of sensation	3	6
At 1 month		
Wound induration	4	8
Scrotal/Cord oedema	1	2
Loss of sensation	4	8
At 6 months	TIPP(n=44)	LR(n=46)

Wound induration	3	9
Loss of sensation	4	8
Recurrence	0	0
At 1year	TIPP(n=30)	LR(n=34)
Wound induration	1	6
Loss of sensation	3	7
Recurrence	0	0

DISCUSSION:

The Lichtenstein's technique is one of the popular methods and is considered to be gold standard of inguinal hernioplasty as it is easy to learn and perform, and gives consistent good results with less than 1% recurrence rates.[vii]

The outcomes favour the TIPP technique as a significantly smaller proportion of patients had acute and chronic postoperative pain or activity-related pain at 1 year after TIPP than after Lichtenstein repair. The TIPP technique was also associated with significantly fewer minor complications.

Patients in our Lichtenstein group had increased incidence of wound and scrotal collection in the immediate post-operative period, as well as wound induration and chronic pain in long term follow-up. Wound seroma and induration can be caused by foreign body reaction to mesh. (Table 2)

Chronic pain and wound complaints delays recovery and can significantly affect a patient's daily lifestyle. Post-herniorrhaphy chronic pain remains the point of major concern for hernia surgeons around the globe with an incidence ranging from 8% to 16%. Mean of pain scores for TIPP group were 3.2 while that of LR group was 3.8 (VAS scale). But the chronic pain scores in our study did not show any significant difference of pain in both the study groups at 6 months and 1 year.

Our study results matches with the study conducted by Berrevoet et. al. (2010) where they observed that after 24 h, 1 week and 1 month, there was significantly less post-operative pain observed in the TIPP group than in the Lichtenstein group and after 1 year, the mean VAS was still higher in the Lichtenstein group, but this was no longer statistically significant.[ix] But the retrospective study by Koning et al. (2010) and a randomized clinical trial by Koning et al. (2012) did not show any significantly better results for Transinguinal preperitoneal repair procedure compared to the Lichtenstein's repair procedure. Both the groups reported low chronic pain.

All these complications are avoided by placing the mesh in the preperitoneal plane by Transinguinal preperitoneal repair. In addition, by placing a mesh in the preperitoneal space, the myopectineal orifice is covered completely which not only is the optimal treatment for indirect, direct, femoral and obturator hernias but also protects against any of these hernias from recurrence. Patients in the Lichtenstein's repair group also had delayed return to work. This was mostly due to the chronic wound related problems. These problems were virtually absent in the Transinguinal preperitoneal repair group.

The study by G. G. Koning et. al.(2012) amd Nienhuijs et. al.(2007) had found statistically significant loss of sensation in Lichtenstein's repair compared to Transinguinal preperitoneal repair.[x] In our study, the loss of sensation was found to be more in the LR group than the TIPP hernia repair group but was not significant. ($p>0.05$)

In TIPP the average operating time is slightly longer than the Lichtenstein procedure which can be attributed to preperitoneal dissection as well as proper placement of the mesh. Complications like peritoneal breach are easily avoided by meticulous technique. Large tears should be repaired with a few stitches of absorbable suture as it helps in proper mesh placement.

CONCLUSION:

From the study we can draw the conclusion Transinguinal preperitoneal repair provides significant advantages over the Lichtenstein technique in case of repair of unilateral inguinal hernias. Patients in preperitoneal repair group had fewer incidences of wound induration and groin pain. As reported in this study, the incidence of pain has been low in both groups.

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