Small Incision preperitoneal (SIP) repair for inguinal hernias—A study of 300 cases.

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ABSTRACT
BACKGROUND: We repaired the inguinal hernia by putting a polypropylene mesh in preperitoneal space formed using an inflatable simple rubber balloon tied on the rubber tube of simple sphygmomanometer (mercury) we found it better in terms of smaller incision, faster dissection, better hemostasis and less post-operative pain and morbidity. METHOD & MATERIALS: Three hundreds patients with inguinal hernia (unilateral or bilateral) were operated under spinal anesthesia putting a small incision(5cm) above the pubic symphysis in midline and polypropylene mesh was kept in the space following the principles same as that of laparoscopic TEP RESULT: Operative time was less as compared to Lichtenstein's repair and Laparoscopic TEP but technique is having long learning curve. There were very less incidence of hematoma , seroma, and recurrence . CONCLUSION: It is an efficient inguinal hernia repair method having all the advantages of Stoppas GPRVS and the laparoscopic TEP with good cosmeses and better patient compliance and less cost.

Key Words: totally extra peritoneal, GPRVS, TEP, Lichtenstein's repair, open TEP, Stoppa's repair.

INTRODUCTION
The strengthening of the posterior wall of the inguinal canal is the principle objective in inguinal hernia repair. The two well established methods are : "tissue-repair technique" and "tension-free prosthetic repair". Tension-free repair has become the gold standard procedure for repairing inguinal hernias. Many techniques have been described by different authors. Synthetic prosthetic material is used in Tension-free repair for posterior wall reconstruction. The Stoppas procedure or giant prosthetic reinforcement of the visceral sac (GPRVS) is well known procedure for Unilateral or bilateral inguinal hernia performed by wrapping the lower part of the parietal peritoneum with prosthetic mesh. which effectively prevents inguinal hernia recurrence by causing fibrosis in that area .GPRVS have a disadvantage in terms of big incision ,we followed the principle of GPRVS repair using small incision, using a specially designed balloon tube fasterdissection, better Hemostasis leading to less post-operative pain and morbidity.

MATERIALSAND METHODS
This is a study of 300 hundred patients, in the hospital in central Gujarat, India. Surgery was done under spinal anaesthesia. There were 158 patients presented with bilateral inguinal inguinal hernia, 106 patients with unilateral inguinal hernia and 36 patients with recurrent inguinal hernia.

Inclusion Criteria
Age > 18 years
Recurrent or primary hernia

Exclusion Criteria
Complete hernia
Complicated hernia (obstructed or strangulated) .
Patients with bleeding disorders.
The procedure's rationale is prosthetic placement occluding the myopectineal ostium of Fruchaud ,with a small incision ,proper Hemostasis .The patient was placed in supine position. A midline infraumbilical incision of 3-4 cm was placed and the upper end of the incision...
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should end at the level of the anterior superior iliac spine (ASIS). [Fig 1].

![Fig 1: Position of incision](image)
The linea alba was cut in the line of the incision and the rectus abdominis muscles were split, the preperitoneal space created by sterilized common rubber balloon tied on a rubber tube attached to the bulb of a sphygmomanometer introduced into the space on the side of the hernia and inflated, thus opening up the preperitoneal space. The dissection with the balloon was carried out to a point just medial to the ASIS. The inflated balloon was kept in situ for 10 minutes to achieve proper hemostasis and then deflated and removed. Further dissection was performed with the index finger in the preperitoneal space as far as the iliopsoas fascia and the ASIS, and in the retropubic space of Retzius in front of the bladder. Deep ring is located, spermatic cord along with contents were separated all around and delivered through the main wound. In cases of direct hernias, the sac reduced instantly with the creation of the preperitoneal space.

Fig. 2: Creating a preperitoneal space using a balloon mounted on rubber tube with bulb.

The sac in indirect hernia was identified after delivering the cord through the main wound and carefully separated from the cord proximally. In cases of recurrent hernia and indirect hernia, the sac was opened at its neck, the contents reduced and the peritoneum was closed with 2-0 absorbable suture. The distal part of the sac was left in situ. A polypropylene mesh of proper size (usually 15x15 cm) was placed in inguinal region and evenly spread to guarantee the most flattened accommodation of the prosthesis in the preperitoneal space. The mesh should cross the midline for about 4 cm. The mesh was fixed to the pubic tubercle by taking a single stitch using Polypropylene 0 (optional). Incision was closed in layers and sterile dressing applied. Compression dressing was applied over the operated area. Post operative evaluation was done in all cases for pain at 6 hrs and 24 hrs after surgery using the Visual Analog Scale (VAS). The score of VAS was divided into four sub-types as follows: mild (1-2), moderate (3-6), severe (7-8) and excruciating (9-10). Any patient with a VAS score > 6 was given Inj. Diclofenac Sodium (100 mg) IV. Occurrence of local complications like hematoma, seroma or infection was noted. All the patients were discharged after 24 hrs of surgery. Stitch removal was done on 10th post-operative day. Patients were followed up for 2 years for recurrence.

RESULTS AND ANALYSIS

Three hundred inguinal hernia patients were repaired over a period of 5 years by this method of which 158 were bilateral and 106 unilateral and 36 recurrent hernias (14 bilateral and 22 unilateral). The mean operating time was recorded to be 46.01 mins for bilateral hernias, 35.76 mins for unilateral hernias, 51.86 mins for recurrent bilateral hernias and 42.14 mins for recurrent unilateral hernias. Chart 1. Mean operating time (in min.)

The mean VAS score recorded at 6 hrs post op was 46.62 mm for bilateral hernias, 31.56 mm for unilateral hernias, 47.29 mm for recurrent bilateral hernias and 44.60 mm for recurrent unilateral hernias. The mean VAS score recorded at 24 hrs post op was
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36.71 mm for bilateral hernias, 25.39 mm for unilateral hernias, 39.29 mm for recurrent bilateral hernias and 35.13 mm for recurrent unilateral hernias. Chart 2. Mean VAS score.

**DISCUSSION**

Tension-free Liechtenstein repair 8,9,10 is a gold standard for inguinal hernias repair. Different authors have mentioned various repairs with comparable success rates. In 1993, Lichtenstein reported his simple tension free mesh hernioplasty placing a polypropylene mesh on the posterior wall of inguinal canal without closure of any tissue defect in more than 3000 cases with only 0.3% recurrence 10. Making it widely accepted and gold standard for the repair of inguinal hernia. The advantages of this technique include, non-requirement of specialized equipments and a very low recurrence rate. The common complications associated are seroma or hematoma, infection and post-operative pain / discomfort due to mesh placement or nerve entrapment, scrotal edema and scrotal pain. In 1982, Ger performed the first laparoscopic groin hernia repair 5. The laparoscopic can be done in three different techniques – Trans-abdominal Preperitoneal repair (TAPP), Total Extra-peritoneal repair (TEP) and Intraperitoneal Onlay Mesh technique (IPOM).

Laparoscopic repair has the advantage of lesser postoperative pain and early discharge from hospital and improved cosmeses. The disadvantages include the need for general anesthesia for all cases and expensive equipments, thus increasing the cost of surgery with a long learning curve – a time period to acquire expertise during which all techniques introduced are perfected, learnt to prevent complications and correcting defects. Chart 1:

**Chart 1. Mean operating time (in Min)**

Mean Operating Time The Stoppa’s (GPRVS) procedure has many advantages, particularly in cases of recurrent or multi recurrent inguinal hernias. A key feature of application of Pascal’s principle in mesh GPRVS is the method, placement that reinforces the lower abdominal wall with a approach that does not disturb groin even in cases that were dissected before. Thus this method is useful in cases of recurrent hernias repair. According to Stoppa 15, GPRVS is indicated in bilateral hernia cases when patient age is over 50 years, and in younger patients when there are risks such as COPD, obesity, large or recurring 13.

**Chart 2: Mean VAS score**

Mean VAS scores

In our study Seroma formation was detected in 10 patients and hematoma in 2 patient (both in early period of our study). managed by sterile dressings and antibiotics on OPD basis conservatively. 2 patients of bilateral inguinal hernia developed recurrence on one side, which was detected on the second, post-operative day. In both the cases, a single mesh of 15cm X 15cm was used to cover the bilateral defect and recurrence occurred, from one side of the mesh as the mesh shifted to another side and the hernia sac protruded from the opposite side. In these cases, Lichtenstein tension free repair was done after 6 months. Open TEP does not require any costly equipment in contrast to laparoscopic repair. and Moreover, the procedure can be done under spinal anesthesia hence it is useful for patients with co-morbid conditions in whom general anaesthesia is contra-indicated. Since the repair is done through
a midline incision, it is inconvenient in cases of bilateral hernia to be dealt with through the same incision. There is no scrotal edema and pain. There is good patient compliance in terms of pain, scrotal hematoma and swelling as compared to Lichtenstein repair. However, the GPRVS procedure requires a very extensive dissection of the preperitoneal space for the insertion and wrapping of the visceral sac in large bilateral mesh prosthesis. The potential complications that might arise are fluid collections due to extensive dissection are seroma, hematoma, and infection. Coda et al., 1997 reported a 24.6% rate of hematoma and seroma. Solorzano et al., 1999 reported 14% hematoma and infectious complications while Beets et al., 1996 reported 22.6% seroma, hydrocele, hematoma, and infectious complications, the use of suction drainage in 83% of the patients prolonged the days of postoperative hospital stay with a mean of 3.5 days. In our study, this led us to think about the use of immediate tamponade effect during dissection using a balloon that may decrease these incidents. According to Stoppa recurrences should be very low with this technique. Nevertheless, although they are rare, they are produced by the placement of mesh with small size or which develops fissures. The recurrence rate in our study is 0.67% (2 in 300 patients), which occurred in a patient of bilateral inguinal hernia repaired using single 15x15 cm mesh for both sides and detected on the second postoperative day. Based on studies by Amid (Amid, 1997) that a shrinkage reduces its size by 20% during the first 6 months, which is compatible to the findings of others. The mesh should not be smaller than 24.16 cm, which is the distance between both iliac spines and from the navel to the pubis (Stoppa, 1999). This size reduction indicates that Stoppa was correct, as he had 0.59% recurrence in primary repair and 1.1% in recurrence with very large mesh. Nevertheless, a recurrence rate of 5.7% has been described with small preperitoneal mesh in the Rives technique.

CONCLUSION
Looking into the advantages and disadvantages of the above mentioned techniques, we performed the method combining the best effects of GPRVS and laparoscopic TEP. It contains advantages like anesthesia – spinal, smaller incision. Our results corroborate the value of the open TEP that reduces the recurrence rate with good cosmesis and excellent patient compliance with very less cost. This procedure incorporates all the advantages of GPRVS and the laparoscopic TEP. It is a very good technique for a cost effective repair of inguinal hernia having major technical benefits. We used self-made inflatable balloon mounted on rubber tube for dissection and tamponade of the preperitoneal space for adequate dissection and prevention of haematoma. Operative time was reduced with an average of 46 mins in our study compared to 51 min described by Stoppa. Small incision, good haemostasis, early discharge and a shorter procedure as an efficient inguinal hernia repair technique. The disadvantage is a long learning curve due to change in anatomical orientation.

REFERENCES
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Hernias by laparoscopy. World JSurg 1993;17(1):46-50


