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A Prospective Analysis Comparing Stoppa's Repair with Conventional Repair in Complex Bilateral and Recurrent Inguinal Hernias.

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Abstract
Background:
The reconstruction of the posterior barrier of the groin represents one of the major objectives in groin hernia repair. There are 2 primary methods used to achieve this objective: "tissue repair technique" and "tension-free repair". Recently, tension-free repair has become the gold standard procedure for repairing inguinal hernias. Many techniques have been described by different authors. Tension-free repair involves the use of synthetic prosthetic materials for rebuilding the posterior inguinal wall. The prosthetic materials, now disposable, have a well toleratedbioreactivity, allow efficient fibroplasia, diminish postoperative pain, and significantly reduce the recurrence rate and convalescence period. The Stoppa procedure, or giant prosthetic reinforcement of the visceral sac (GPRVS), is performed by wrapping the lower part of the parietal peritoneum with prosthetic mesh. The mesh contributes to a physiological healing process that creates a special bilateral anatomical reinforcement in the inguinal region, which effectively prevents inguinal hernia recurrence.
Materials and Methods
Fifty patients, of ASA I or II, attending the Govt.GH Chennai in our surgical unit large bilateral inguinal hernias or recurrent hernias or complex groin hernias are prospectively studied over a period 2 years from sep 2005 – sep 2007. Twenty five patients, mostly with recurrence and large bilateral hernias underwent Stoppa's procedure and the other twenty five with mostly bilateral hernias and that associated with hydrocele underwent bilateral conventional hernia repairs.
The following parameters are studied:
- *Pre operative diagnosis and the procedure done.*
- *Mean duration of the operation (calculated from the time of incision to wound dressing after closure)*
- *Mean rate of wound infection (reported when frank pus discharge or showing positivity in culture and sensitivity)*
- *Mean rate of seroma collection (noted clinically as pink non purulent discharge or collection)*
- *Duration of stay in the hospital*
- *Local recurrence if any*

The patients are followed up in the 6th month and 1 year post operatively for any event of recurrence. The patients who are discharged early are advised to report immediately in case of wound infection or seroma collection.A (6" x 6") monofilament poly propelene mesh (undyed) is used on each side for a conventional hernia repair and bigger size mesh as per the requirement of patient for stoppas repair.
Results
1. In cases of only bilateral indirect inguinal hernias – in 75% of cases surgeons sorted conventional procedures and in 25% of cases stoppa's repair being done. In bilateral direct inguinal hernias – in 65% of cases stoppa's repair being preferred and conventional repair in 35% of cases. However, in recurrent and complex groin hernias 90% of the times stoppa's repair is done and in only 10% of cases conventional repair sorted to. In hernias associated with hydrocele always conventional procedure is preferred.
2. The mean operation time for stoppa's repair is 68.8 minutes and that of the conventional bilateral repair usually started simultaneously is 48.8 minutes. There is a significant difference in the mean operation time of up to 20 minutes.
3. Wound infection is uncommon in both the groups except for 1 case in each group leading to an infection rate of 4%.

4. Seroma collection in stoppa's repair group is 12% and the conventional group is 4%. Thus seroma collection is three times more common in the stoppa's repair group.
5. The mean duration of hospital stay in stoppa's repair group is 8.28 days and that in the conventional hernia repair group is 4.76 days. A significant difference in the duration of hospital stay of up to 3.52 days.
6. Recurrences are uncommon in either group with one case in each group leading to a recurrence rate of 4%.

Conclusions

1) Stoppa's repair is a better procedure for complex bilateral and recurrent hernias than the conventional repair due to its pre peritoneal approach, clear delineation of anatomy and vast size of mesh.
2) The mean operation time increased by 20 minutes (p<.05 significant) in Stoppa's repair, but the operating team lessened by half.
3) There is no difference in the wound infection rates (4%) between the two groups.
4) The mean seroma collection rates in stoppa's repair (12%) is thrice that of the conventional group (4%) (p<.05% significant), but can be overcome with strict hemostasis, suction drains and experience.
5) There is no difference in the recurrence rates (4%) between the two groups at 1 year follow up. A bigger sample size and more years of follow up are necessary.

Key words: *Complex hernia,stoppasrepair,conventional hernia repair*

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I. Introduction

The reconstruction of the posterior barrier of the groin represents one of the major objectives in groin hernia repair. There are 2 primary methods used to achieve this objective: "tissue repair technique" and "tension-free repair". Recently, tension-free repair has become the gold standard procedure for repairing inguinal hernias. Many techniques have been described by different authors. Tension-free repair involves the use of synthetic prosthetic materials for rebuilding the posterior inguinal wall. The prosthetic materials, now disposable, have a well toleratedbioreactivity, allow efficient fibroplasia, diminish postoperative pain, and significantly reduce the recurrence rate and convalescence period. The Stoppa procedure, or giant prosthetic reinforcement of the visceral sac (GPRVS), is performed by wrapping the lower part of the parietal peritoneum with prosthetic mesh. The mesh contributes to a physiological healing process that creates a special bilateral anatomical reinforcement in the inguinal region, which effectively prevents inguinal hernia recurrence. The procedure's rationale is based on an elegant surgical and anatomical prosthetic placement that occludes the myopectineal ostium of Fruchaud. The GPRVS procedure requires wide dissection of the subfascialpreperitoneal space. As a corollary, the GPRVS operation calls for the use of suction drainage. Sometimes this drainage procedure is responsible for longer hospitalization that may be as long as 9.7 days11. Since the description of GPRVS procedure, many surgeons have reported good outcomesStoppa and colleagues used the posterior approach to implant an impermeable barrier around the entire peritoneal bag, demonstrating that permanent repair of groin hernias does not require closure of the abdominal wall defect per se. Without having stated it, their repair used a tension-free technique .Wantz furthered Stoppa's work by using it for unilateral hernia repair .Essential to these and all subsequent tension-free repairs is the application of a barrier prosthesis, usually a permanent mesh. In Stoppa's approach, the mesh is held in place by intra-abdominal pressure, an application of Pascal's principle.

Patients and Methods

Fifty patients, of ASA I or II, attending the Govt.GH Chennai in our surgical unit large bilateral inguinal hernias or recurrent hernias or complex groin hernias are prospectively studied over a period 2 years from sep 2005 – sep 2007. Twenty five patients, mostly with recurrence and large bilateral hernias underwent Stoppa's procedure and the other twenty five with mostly bilateral hernias and that associated with hydrocele underwent bilateral conventional hernia repairs.

The following parameters are studied:

- Pre operative diagnosis and the procedure done.
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- Duration of stay in the hospital
- Local recurrence if any

The patients are followed up in the 6th month and 1 year post operatively for any event of recurrence. The patients who are discharged early are advised to report immediately in case of wound infection or seroma collection.

II. Materials

A monofilament poly propylene mesh (undyed) is used on each side for a conventional hernia repair and bigger size prolene mesh according to the pelvic measurements of the patientis used accordingly instoppas and bilateral inguinal hernia repairs.

III. Results

1. In cases of only bilateral indirect inguinal hernias – in 75% of cases surgeons sorted conventional procedures and in 25% of cases stoppa's repair being done. In bilateral direct inguinal hernias – in 65% of cases stoppa's repair being preferred and conventional repair in 35% of cases. However, in recurrent and complex groin hernias 90% of the times stoppa's repair is done and in only 10% of cases conventional repair sorted to. In hernias associated with hydrocele always conventional procedure is preferred.
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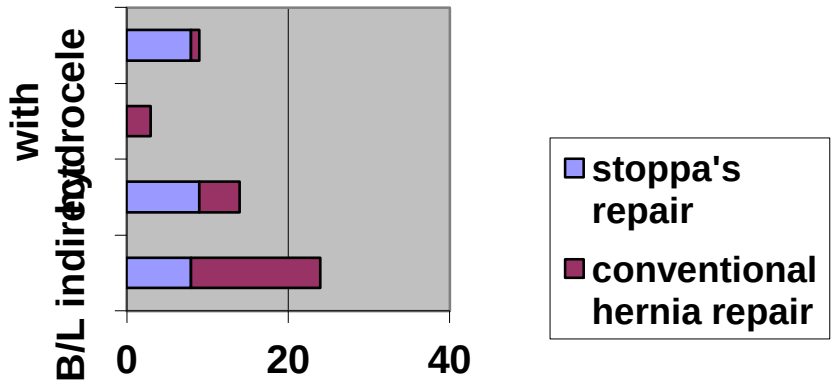
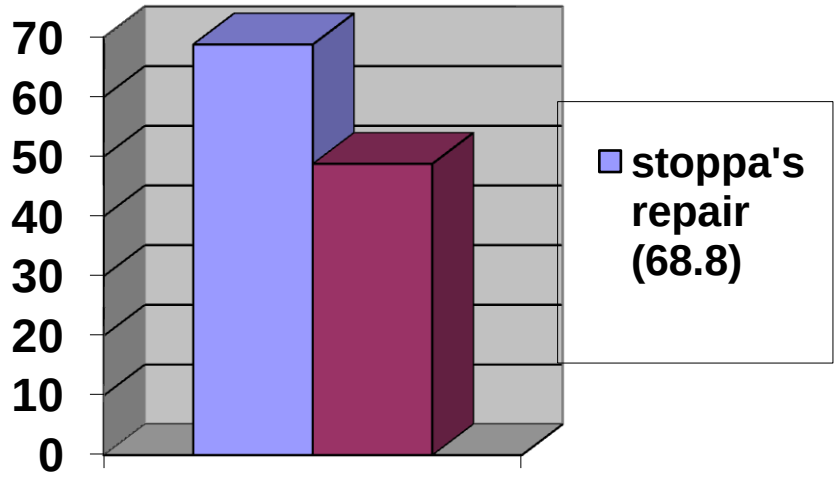
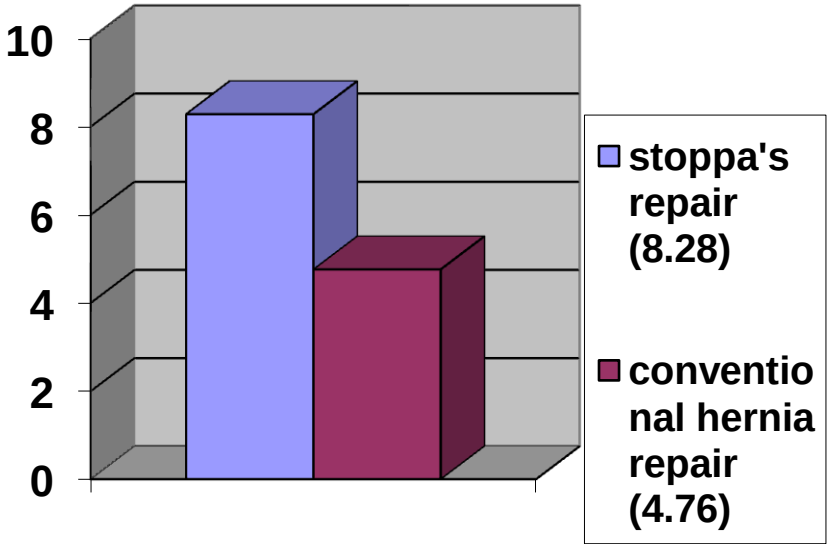
Preoperative diagnosis and the procedure done



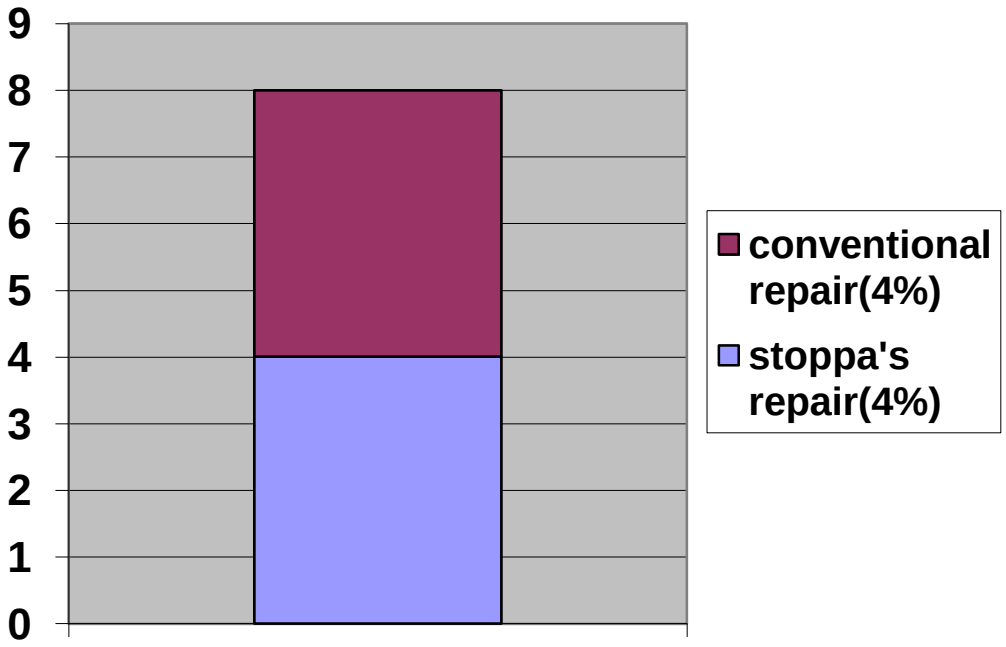
Comparison of mean operation time in minutes



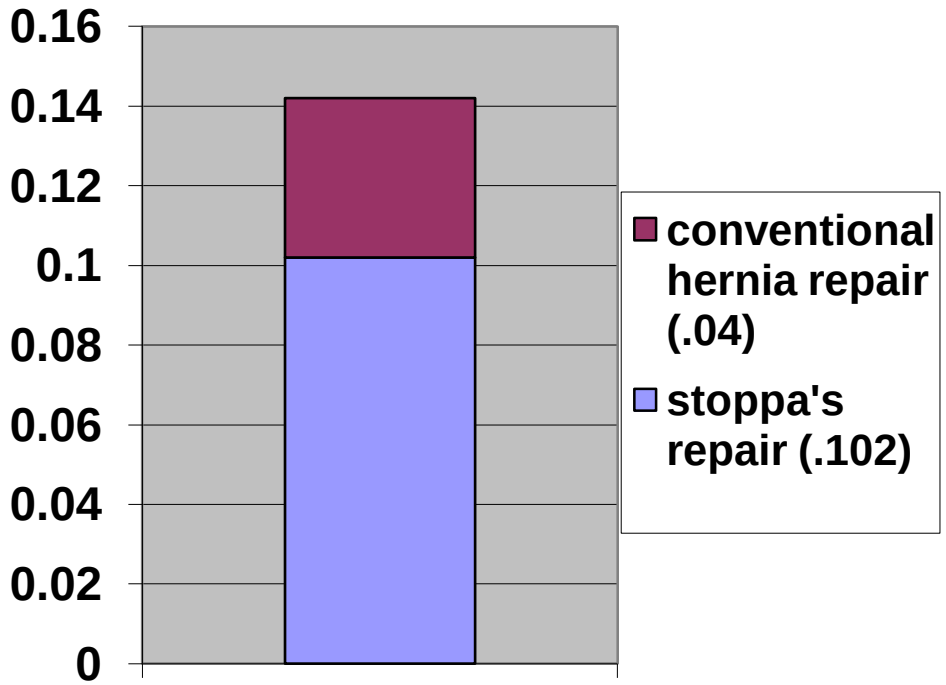
Comparison of mean duration of hospital stay in days



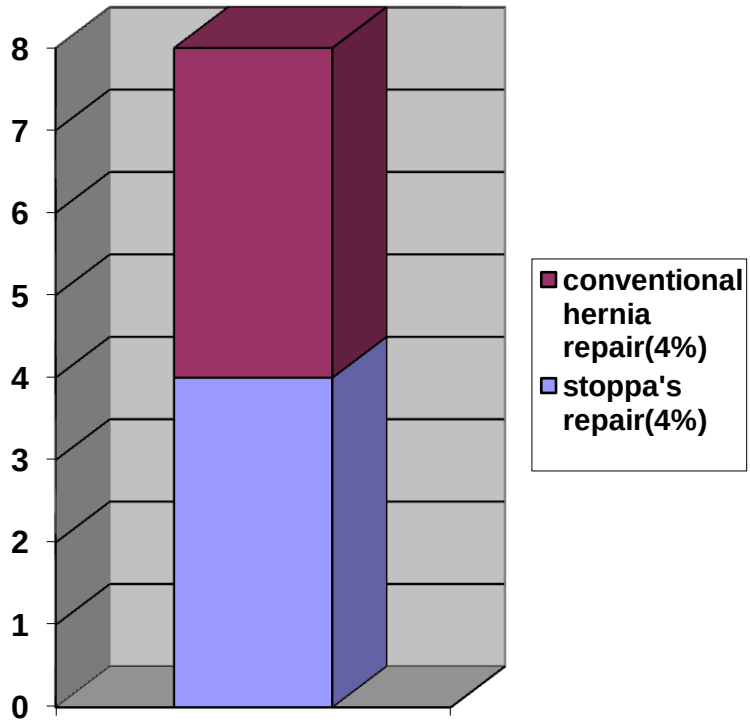
Comparison of mean rates of wound infection



Comparison of mean rates of seroma collection



Comparison of mean recurrence rate



IV. Discussion

1) The pre- operative diagnosis influenced the decision made for the type of procedure. From the observations made, it is seen that recurrent hernias are often treated with Stoppa's repair.

Recurrent Hernias

An estimated 25% of all hernia recurrences present within a year of the hernia repair. Another 25% will become evident by the fifth postoperative year. The remaining 50% of recurrences occur more than 5 years after the surgical repair.[37]

- In recurrent hernias, the anatomy of the inguinal canal is altered due to fibrosis.
- An understanding of the causes of failed hernia repairs is essential for successful second repairs. Since the widespread use of anterior onlay mesh repairs and plugs, recurrences occur more commonly around the internal ring, and lateral to it (Gilbert-types 2 and 3, and interstitial). Where plugs alone are used for primary repairs, recurrences present both medially and laterally to the plug.
- Failures after sutured onlay graft repairs usually relate to using a graft that is too small or short-changing the tails of the graft around the spermatic cord. When the onlay graft is used in a sutureless manner, recurrences frequently appear at the pubic tubercle by lifting the graft at its medial angle.

Keeping in consideration, the above reasons, it is difficult to sort to conventional hernia repair for poor delineation of anatomy, medial and lateral recurrences and enormous B/L hernias making the repair difficult.

The advantages of (stoppa's) pre peritoneal approach is

- clear understanding of the hernial lesions,
- direct access to posterior inguinal structures,
- ability to place a large mesh behind the weak groin area

  Hence, the pre peritoneal approach is perfectly convenient for large bilateral, multi recurrent and prevascular hernias.[17]

2) The mean operation time for stoppa's repair is 20 minutes more than that of conventional repair. But it is to be noted that the conventional repairs are usually started simultaneously and the operating team is double than that of the stoppa's repair.

3) Wound infection – reported as 4% in each group and is negligible. It is unrelated to the type of mesh and technique. It is majorly dependant on the co-morbid factors and use of poly filament suture materials. Thus there is no significant difference between the two groups in rates of wound infection.

4) Seroma collection – more common with the mesh repairs is about three times as common in the Stoppa's repair group than the conventional group. This is due to wide creation of tissue planes and using a pfanensteil incision in Stoppa's repair. However this can be overcome by lower midline approach, strict hemostasis and use of suction drains.
5) Duration of stay in the hospital – the mean duration of stay is increased by 3.5 days in the stoppa's repair group is 3.52 days. This is mainly due to the placement of suction drains and the fear of seroma collection which can be easily overcome more precise technique and experience.
6) Recurrence – it is an untoward incident in the natural course of any hernia repair. The recurrence rates are 4% in each group and there is no significant difference between the two groups in rates of recurrence.

V. Conclusions

1) Stoppa's repair is a better procedure for complex bilateral and recurrent hernias than the conventional repair due to its pre peritoneal approach, clear delineation of anatomy and vast size of mesh.
2) The mean operation time increased by 20 minutes ($p<.05$ significant) in Stoppa's repair, but the operating team lessened by half.
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