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ORIGINAL RESEARCH

Study of Clinical Outcome of Open Mesh Hernia Repair and External Oblique Aponeurosis (Desarda Repair)

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ABSTRACT

Background: To compare the short term outcomes and recurrence rate for one year between Lichtenstein's and Desarda technique.

Materials and Methods: This was an observational study. 30 patients operated from September 2018 to August 2020 that have undergone Desarda repair and 30 patients have undergone Lichtenstein mesh hernioplasty for inguinal hernia were included in study making total 60 hernial sites repaired. Postoperatively patients were observed for any complications and were followed up in OPD after discharge. Thorough examination was done on follow-up to detect any complications. Visual analogue scale was used for assessment of severity of pain.

Results: Majority of the patients were male. Incidence of inguinal hernia was most on the right side followed by left side and then bilateral. All the patients in study were followed for 6 months and observed for recurrence and complications. That patient undergoing desarda repair were discharged earlier which is statistically significant. Mean duration of ambulation is less for desarda repair compared to mesh hernioplasty which is statistically significant. There was no intraoperative complication recorded. Incidence for post operative wound infection was less in desarda repair. Recurrance was observed in one patient of desarda group. Incidence of seroma and hematoma formation was more in mesh hernioplasty which is statistically not significant.

Conclusion: Desarda technique is more commonly performed especially in rural area as it is more economical compared to Lichtenstein method. Desarda repair has low mean hospital stay as compared to Lichtenstein repair. Hence, it is fair to compare Desarda's no mesh repair with Lichtenstein's mesh repair.

Keywords: Desarda technique, Lichtenstein's mesh repair.

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INTRODUCTION

Hernias are abnormal protrusions of a viscus or part of viscus through a normal or abnormal opening in a cavity (usually the abdomen). Hernias of the abdominal wall constitute an important public health problem and often pose a surgical dilemma even for the most skilled surgeons. They are most commonly seen in the groin; a minority are paraumbilical or

incisional. In the groin, inguinal hernias are more common than femoral hernias. An indirect hernia is defined as a defect protruding through the internal or deep inguinal ring, whereas a direct hernia is a defect protruding through the posterior wall of the inguinal canal. To put it in a more anatomic way, an indirect hernia is lateral to the inferior epigastric artery and vein, whereas a direct hernia is medial to these vessels. Hernia is one of the common treatable surgical conditions. Synthetic mesh most often used in the inguinal area may in some cases create new problems, such as foreign body sensation in the groin, discomfort, and abdominal wall stiffness, surgical site infections, migration of mesh and may affect sexual function, The cost and availability of mesh prostheses in under developed regions proves to be a major problem. The requirement is to find a technique that is simpler, effective in term of cost, easy to perform or use of a foreign body, and also gives an acceptable recurrence rate without any intra or post-operative complications and can be performed as a day care procedure to reduce the burden of cases in community.

A possible option for this is the Desarda Repair, presented in 2001, which uses an undetached strip of aponeurosis of the external oblique muscle instead of a mesh and has shown to have promising results in studies conducted so far. Hence this study has been planned to assess if Desarda's technique is suitable for early return to normal activities after surgery, less post operative pain and minimum dose of analgesics and acceptable recurrence rates. This will help reduce the hospital stay and burden of the hospitals as these patients can be operated at less cost with minimal discomfort. Present study deals with the comparison of outcome of the Lichtenstein repair and Desrada‘s repair for inguinal hernia.

MATERIALS & METHODS

The present study was conducted in the department of surgery and associated Hamidia Hospital, Bhopal during the period of September 2018 to August 2020.

Study Type: Observational

Study Design: Prospective Observational Study.

Study Period: September 2018 to August 2020.

Material Required Subjects for Desarda Repair, Surgical Materials

Sample Size:60 Patients

Method This was an observational study: 30 patients operated from September 2018 to August 2020 that have undergone Desarda repair and 30 patients have undergone Lichtenstein mesh hernioplasty for inguinal hernia were included in study making total 60 hernial sites repaired. Postoperatively patients were observed for any complications and were followed up in OPD after discharge. Thorough examination was done on follow-up to detect any complications. Visual analogue scale was used for assessment of severity of pain. All relevant investigations were done. Pre anaesthetic fitness of all the patients was taken prior to surgery. A formal consent was taken explaining inclusion of patient in study and explaining the procedure.

Inclusion Criteria

All cases of inguinal hernia admitted for surgery

- Above 18 years of age.
- With a primary, reducible inguinal or inguino-scrotal hernia; unilateral

Exclusion Criteria

- Obstructive uropathy or chronic obstructive pulmonary disease- because they are contraindications to elective hernia surgery. They are associated with definite poor outcomes such as high recurrence rates.

- Old and debilitated patients of poor general condition as they will be unable to give an accurate assessment of the key outcomes of the operation.
- Patients with strangulated hernia.
- Recurrent Hernias.
- Per operative finding of separated, thin and/or weak external oblique aponeurosis

RESULTS

Table 1: Incidence of Inguinal Hernia in Different Age Groups

Sex	Group Desarda		Group Mesh		p value
	Frequency	%	Frequency	%	
<=30 yrs	5	16.7%	4	13.3%	0.004
31 - 40 yrs	6	20.0%	6	20.0%	
41 - 50 yrs	11	36.7%	2	6.7%	
51 - 60 yrs	7	23.3%	5	16.7%	
61 - 70 yrs	1	3.3%	8	26.7%	
>70 yrs	0	0.0%	5	16.7%	
Total	30	100%	30	100%	

Table 2: Sex Destribution of Procedure Done in this Study

Sex	Group Desarda		Group Mesh		p value
	Frequency	%	Frequency	%	
Female	0	0.0%	1	3.3%	1.000
Male	30	100.0%	29	96.7%	
Total	30	100%	30	100%	

Table 3: Left and Right Sided Inguinal Hernia

Diagnosis	Group Desarda		Group Mesh		p value
	Frequency	%	Frequency	%	
Bilateral Inguinal Hernia	5	16.7%	10	33.3%	0.033
Left Inguinal Hernia	7	23.3%	12	40.0%	
Right Inguinal Hernia	18	60.0%	8	26.7%	
Total	30	100%	30	100%	

Table 4: Follow-up Duration in Both Group

Followup (in months)	Group Desarda		Group Mesh		p value
	Frequency	%	Frequency	%	
6 months	30	100.0%	30	100.0%	–
Total	30	100%	30	100%	

Table 5: Mean Duration of Hospital Stay in Both Group

	Group Desarda	Group Mesh	p value
	Mean ± SD	Mean ± SD	
Hospital Stay	5.23 ± 1.81	7.10 ± 1.61	<0.001

Table 6: Duration of Hospital Stay in Both Group

Hospital Stay	Group Desarda		Group Mesh		p value
	Frequency	%	Frequency	%	
3 days	8	26.7%	0	0.0%	0.009

4 days	5	16.7%	3	10.0%	
5 days	2	6.7%	2	6.7%	
6 days	5	16.7%	5	16.7%	
7 days	7	23.3%	6	20.0%	
8 days	3	10.0%	7	23.3%	
9 days	0	0.0%	7	23.3%	
Total	30	100%	30	100%	

Table 7: Mean Ambulation Time in Both Group

	Group Desarda	**Group Mesh**	**p value**
	Mean ± SD	**Mean ± SD**	
Ambulation Time	2.23 ± 1.24	3.10 ± 1.33	<0.001

Table 8: Duration of Post Operative Pain

Pain	**Group Desarda**		**Group Mesh**		**p value**
	Frequency	**%**	**Frequency**	**%**	
<3 days	22	73.3%	16	53.3%	0.108
>3 days	8	26.7%	14	46.7%	
Total	30	100%	30	100%	

Table 9: Postoperative Wound Infection

Postoperative Wound Infection	**Group Desarda**		**Group Mesh**		**p value**
	Frequency	**%**	**Frequency**	**%**	
No	28	93.3%	27	90.0%	1.000
Yes	2	6.7%	3	10.0%	
Total	30	100%	30	100%	

Table 10: Recurrance

Recurrance	**Group Desarda**		**Group Mesh**		**p value**
	Frequency	**%**	**Frequency**	**%**	
No	29	96.7%	30	100.0%	1.000
Yes	1	3.3%	0	0.0%	
Total	30	100%	30	100%	

30 patients operated from September 2018 to August 2020 that have undergone Desarda repair and 30 patients have undergone Lichtenstein mesh hernioplasty for inguinal hernia were included in study making total 60 hernial sites repaired. Majority of the patients were male. Incidence of inguinal hernia is most on the right side followed by left side and then bilateral. All the patients in study were followed for 6 months and observed for recurrence and complications. Above data shows that mean duration of hospital stay is less for desarda repair which is statistically significant. That patient undergoing desarda repair were discharged earlier than those of mesh hernioplasty. Mean duration of ambulation is less for desarda repair compared to mesh hernioplasty which is statistically significant. Post operative pain in majority of patients was for less than three days. There was no intraoperative complication recorded. Incidence for post operative wound infection was less in desarda repair. Recurrance was observed in one patient of desarda group. Incidence of seroma formation was more in mesh hernioplasty which is statistically not significant. Incidence of hematoma formation was more in mesh hernioplasty which is statistically not significant.

Statistical analysis:

The collected data was summarized by using frequency, percentage, mean & S.D. To compare the qualitative outcome measures Chi-square test or Fisher's exact test was used. To compare the quantitative outcome measures independent t test was used. If data was not following normal distribution, Mann Whitney U test was used. SPSS version 22 software was used to analyse the collected data. p value of <0.05 was considered to be statistically significant.

DISCUSSION

Inguinal hernia is one of the most common condition afflicting humans.[17] The main cause of inguinal hernia in most of the patients is weak posterior imguinal canal therefore the main goal of hernia repair should be focused at providing a strong, mobile and physiologically active posterior wall of the inguinal canal.[18] Mesh repair is now commonly used and is most often referred to as the gold standard technique.[19]

But this surgery is associated with more complications like chronic groin pain, seroma, testicular atrophy etc., mostly in the hands of less experienced junior consultants. Mesh is also costly and is not available in many parts of the world. Though mesh acts like a mechanical barrier, it does not provide a mobile and dynamic posterior wall.[20]

Lichtenstein Mesh repair is now widely used, and is often referred to as the gold standard despite a relatively paucity of clinical trial comparing mesh with suture repair,[21] Lichtenstein mesh hernioplasty is the golden standard for inguinal hernia. Though, using mesh has its own limitation and complication for example its cost and recurrence. Mesh shrinks by 20-40% of its size and fold, wrinkle and curl.[1]

Recurrence rate for Lichtenstein repair is less than 2% but Liem et al, has claimed recurrence rate of 6.3% at 2 years and 10% in 4 years.[22] In a study by Shin et al infertility in patients on whom mesh hernioplasty was performed seems to be mesh, which caused trapped or obliterated.[23] Robinson et al reported 252 complication including infection (42%), mechanical failure (18%), pain (9%), reaction (8%), intestinal complication (7%), adhesions (6%), seroma (4%), erosion (2%), and other (4%).[6]

Groin pain has been found to be due to fibrous reaction to foreign body in case of mesh repair, leading to spermatic cord and nerve enmeshment, which affects the quality of life of the patient.[14] The EU hernia collabration made a systemic revision of the randomized prospective studies and analysis of the result of different studies. The use of synthetic mesh substantially reduces the risk of hernia recurrence irrespective of placement method. Mesh repair appears to reduce the chance of persisting pain rather than increase it.[24]

Cost of surgery and post-operative morbidity affecting the quality of life are important consideration in the inguinal hernia surgery. There are no clear scientific evidence to improve to prove that the mesh prosthesis repair is superior to non-prosthesis repair in this respect.[25]

Standard tissue repairs like Shouldice, Bassini also require expertise and are associated with tension in the repaired tissue. Hence this study compares Desarda technique which is a relatively simple tissue repair, does not require a foreign body like mesh, cost effective, with minimal complications, with Lichtenstein's tension free mesh repair.[26]

There are advantages and disadvantages associated with all types of open inguinal hernia surgery. Existing non prosthesis repair (Bassini/Shuldice) is blamed for causing tissue tension and mesh repair is blamed for causing complication of foreign body. Desarda's suture an undetached strip of the external oblique aponeurosis between the muscle arch and the inguinal ligament to give a strong and physiologically dynamic posterior wall.[27]

Desarda, described a new technique of inguinal hernia repair. In his surgery, a strip of external oblique aponeurosis is partly separated from its medial leaf, keeping its continuity intact at either end this is sutured to the inguinal ligament below, and the arch of the muscle

above, behind the cord, to form a new posterior wall. Contraction of the external oblique muscle creates lateral tension in this strip while contraction of the internal oblique/conjoined muscle creates tension upwards and laterally, making the strip a shield to prevent any herniation. So additional strength given by the external oblique muscle to the weakened conjoined tendon to create tension in the strip and prevent re-herniation is the essence of this operation. Tension created in this strip is graded. Stronger intra- abdominal blows result in stronger abdominal muscle contractions leading to increased tension in this strip to give graded protection. At rest the strip is without any tension. Thus, a strong and physiologically dynamic posterior wall is created. The aging process is minimum in the tendons and aponeurosis, so a strip of the external oblique, which is tendo-aponeurotic, is the best alternative to the mesh.[13]

The posterior wall of the inguinal canal was weak and without dynamic movement in all patients. Strong aponeurotic extensions were absent in the posterior wall. The muscle arch movement was lost or diminished in all patients. The movement of the muscle arch improved after it was sutured to the upper border of a strip of the external oblique aponeurosis (EOA). The newly formed posterior wall was kept physiologically dynamic by the additional muscle strength provided by external oblique muscle to the weakened muscles of the muscle arch. A physiologically dynamic and strong posterior inguinal wall, and the shielding and compression action of the muscles and aponeurosis around the inguinal canal are important factors that prevent hernia formation or hernia recurrence after repair. In addition, the squeezing and plugging action of the cremasteric muscle and binding effect of the strong cremasteric fascia, also play an important role in the prevention of hernia.[28]

This method satisfies the rule of 'No tension' that is used in Lichtenstein's mesh repair, as well as provides a physiologically sound, dynamic posterior wall of inguinal canal.[29] As the aging process is minimum in the tendons and aponeurosis, a strip of the external oblique, which is tendo-aponeurotic, is the best alternative to the mesh, which is used in Desarda's technique.[30]

He claimed his method to be simple and an effective method of surgical correction leading to early ambulation, less hospital stays, early return to normal activities, with no recurrence and less complication rates.[31] Szopinski et al,[32] stated in their Randomized controlled trial that the Desarda's technique has the potential to enlarge the number of tissue based method available to treat groin hernias. The most evident indication for use financial constraints or if a patient disagree with the use of mesh. Losananoff and Millis criticised Desarda repair and objected for incomplete and unreliable method of followup in his study.[33]

Naguib et al, also said that follow-up in Desarda study as well as tension free technique was unsatisfactory.[34] In the present study, there is a statistical significant difference between the Desarda and Lichtenstein methods in regard to ambulation time and hospital stay.Abbas et al, stated to have similar operative time in both groups.[35]He used interrupted sutures to stich external oblique strip to conjoint tendon which may have prolonged the operative time. In the study 1 seroma and 2 wound infection was observed in Desarda group but Lichtenstein group 4 seroma and 3 wound infection was observed, which was not significant. Abbas et al, reported seroma formation rate 0% in Desarda and 1.4% in Lichtenstein repair.[36]

Desarda's technique being a pure tissue repair, and hence no fibrous reaction to produce groin pain. In present study, patients were classified into those who had groin pain for 7 days. 73% of the patients in the Desarda group experienced pain only for less than 3 days whereas 46.7% of the patients in Lichtenstein's method had pain for 3- 7days. Surgical site infection was higher in Mesh repair (10%) when compared to Desarda's technique (6.7%). Desarda et al showed a recurrence of 1.97%, but it was observed during a 10-year follow-up. But in this study both the groups had no recurrences during 2-year followup which indicates the necessity for a large scale and long-term follow-up to identify recurrences if any.

No patient had severe pain postoperatively and nearly all patients (n = 396) were free of pain and discomfort after the second postoperative day. 340 patients (85%) were discharged by the 4th postoperative day, and most returned to normal activities within 2 weeks. There was 1 early Haematocele, and 1 recurrence at 2 years.[37] One week after the hemia repair patients in both groups equally classified the intensity of the pain (VAS). Six months after the hospitalization the effect of performed surgery was described as good or very good. Only one patient in group I was unsatisfied with the surgery results. In This study mild to moderate pain only noticed mild to moderate on 1st, 3rd, 5th post-operative days was less in desarda's group as compare to Lichtenstein group which was statistically not significant. A total of 60 male patients were randomly assigned to the D or M group (30 vs. 30, respectively). The primary outcomes measured were recurrence and pain. Additionally, early and late complications, foreign body sensation, and return to everyday activity were examined in hospital and at 7, 30 days, and 6 months after surgery. During the follow-up, one recurrences were observed in D group (p = 1.000). Foreign body sensation and return to activity were not different between the groups. There was less seroma and hematoma production in the D group (p=0.353). In this study, the postoperative pain patterns and time taken to resume normal gait were similar for both groups. All patients had resumed normal gait by the 10th POD.

The first pain assessment was done 6 to 8 hours postoperative because all these operations were done under spinal anesthesia, therefore, these patients were fully conscious and alert. This was taken as a baseline measure of pain. The mean pain score in both groups was higher than that observed in a multivariate analysis comparing several methods by Lau and Lee.[38] However, they used post incision infiltration of macain, which we did not do in this study. They also gave a combination of oral dextropropoxyphene 32.5mg and voltaren suppositories 50mg to each patient compared to only 75 mg of injectable diclofenac given to each patient in this study. Combination treatment is more effective than monotherapy in pain management; however it also increases the cost per patient. The next pain assessment was done on 3rd POD. The mean score for Desarda was slightly higher than that of Mesh repair. These however differ from those reported by Desarda, who reported that 96 percent of his patients reported mild pain in the first 4 days and none had severe pain.[33] However, he did not state the extent of mild as per VAS he used, dosages of drugs and time of pain assessment. His mode of assessment of the pain was not clearly stated.

Other comparative studies have found the pain index to be highest with the Bassini repairs as compared to the others.[38] Our findings in this study imply that the Desarda technique offers similar tension to the mesh repair if the amount of pain is equivalent to the tension in suture lines other factors being constant. The last pain assessment was done on the 7th POD when the patient had come for stitch removal. Again, the patterns were similar for both groups. The two patients who scored 9 and 10 in the respective group had wound sepsis, which caused a pressure effect due to pus formation on a closed wound, and hence significantly increased the pain. The analgesics had been stopped 2 days earlier on the 5th POD. There was no statistically significant difference between the postoperative score and the method used for hernia repair on the 7th POD. This is also in agreement with what Lau and Lee,[38] reported that that postoperative pain in hernia repair was not affected by method used on the 7th and 14th POD. Using Pearsons 'correlation coefficient, there was no statistically significant correlation between the postoperative pain score and the operation group 2 hours post operative, on the 3rd POD and the 7th POD. This correlation decreases further from 2 hours postoperative to the 7th POD. These findings are in agreement with previous comparative studies.[38,39]

CONCLUSION

Desarda technique is more commonly performed especially in rural area as it is more economical compared to Lichtenstein method. Desarda repair has low mean hospital stay as compared to Lichtenstein repair. Hence, it is fair to compare Desarda‘s no mesh repair with Lichtenstein‘s mesh repair.The Lichtenstein repair compared to Desarda‘s repair does not have significantly more local complications. Desarda‘s no mesh repair compared to Lichtenstein‘s mesh repair produces same or even better results. Although large scale and Long term follow up may be required to identify any recurrent cases.

Declarations:

Funding: None Conflicts of interest/Competing interests: None Availability of data and material: Department of Surgery Gandhi Medical College & Hamidia Hospital Bhopal Code availability: Not applicable Consent to participate: Consent taken Ethical Consideration: There are no ethical conflicts related to this study. Consent for publication: Consent taken

What This Study add to Existing Knowledge Both Lichtenstein repair and Desarda procedures of primary inguinal hernia repair have same procedure and complexity. Desarda technique is more commonly performed especially in rural area as it is more economical compared to Lichtenstein method. Desarda repair has low mean hospital stay as compared to Lichtenstein repair. Desarda‘s no mesh technique is easy and simple . It is more feasable. It can be performed even under local anesthesia, if patient is unfit for regional/ general anesthesia. It has comparatively less duration of surgery and has rapid recovery. It can be used in various scenario such as contaminated surgical field, young patients and in financial constraints. Hence, it is fair to compare Desarda‘s no mesh repair with Lichtenstein‘s mesh repair.

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