

Post Operative Outcome of Desarda Technique Versus Lichtenstein Mesh Hernioplasty for Inguinal Hernia Repair

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ABSTRACT

Background: Current inguinal hernia operations are generally based on anatomical considerations. Failures of such operations to some extents are due to lack of consideration of physiological aspects. Many patients with inguinal hernia are cured because of current techniques of operation, though factors that are said to prevent hernia formation are not restored. Therefore, the surgical physiology of inguinal canal needs to be reconsidered. In the year 2001, Mohan P Desarda first described a physiological repair technique of inguinal hernia, which is practiced in many centers with significantly positive outcome. To evaluate the post-operative outcome of Desarda technique versus Lichtenstein mesh hernioplasty in inguinal hernia repair, this research has performed.

Materials and methods: This Quasi experimental study was carried out in Surgery Department of Chittagong Medical College Hospital, during December 2017 to January 2019. A total of 100 patients with inguinal hernia underwent surgery were included in this study. Samples were selected by convenient technique. Among them 50 patients were selected for Desarda Technique was considered as group I and the rest 50 patients were selected for Lichtenstein Mesh Hernioplasty was considered as group II. Statistical analysis of the results was obtained by using window-based computer software devised with Statistical Packages for Social Sciences (SPSS-22).

Results: The proposed sample size was 50 in each group. The study group included male patient above 18 years of age undergoing Desarda Technique and Lichtenstein Mesh Hernioplasty for inguinal hernia repair. The mean age was 43.14±14.44 years in group I and 48.33±12.63 years in group II. Indirect hernia was found 37(74.0%) and 28(56.0%) in group I and group II respectively. The mean 3rd POD pain (NPRS) was 4.44±0.97 in group I and 5.52±0.71 in group II. The mean 10th POD pain Numeric Pain Rating Scale (NPRS) was 0.76±1.02 in group I and 2.62±1.21 in group II. The mean 1 month pain (NPRS) was 0.08±0.27 in group I and 0.72±0.7 in group II. The mean 3rd month pain (NPRS) was 0.02±0.14 in group I and 0.34±0.48 in group II. The mean 6th month pain (NPRS) was 0±0 in group I and 0.2±0.45 in group II. Pain (NPRS) was significantly ($p<0.05$) higher in group II in 3rd POD and all subsequent follow-up. Seroma was found 5(10.0%) at 10th POD in group I and 5(10.0%) in group II. The difference was statistically not significant ($p>0.05$) between two groups. Wound infection found 2(4.0%) in 3rd POD in group I and 5(10.0%) in group II. Wound infection didn't develop in subsequent follow-up in group I but in group II, 1(2.0%) found in 10th POD, 1(2.0%) in 1 month, 1(2.0%) in 3rd month, 1(2.0%) in 6th month. The difference was not significant ($p>0.05$) between two groups. Recurrence was not observed in either group during this study period.

Conclusion: Desarda technique of inguinal hernia repair in our set up is useful with comparable results to Lichtenstein hernioplasty.

Key words: Desarda technique; Lichtenstein; Open inguinal hernia repair.

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Introduction

The expected risk for inguinal hernia is 27% for males and 3% for females.¹ The complication rate per year all over the world varies from 100 to 300 per 100,000 citizens.² In the European Hernia Society guidelines (2009), hernioplasty techniques, the Lichtenstein technique and endoscopic methods were recommended for the surgical management of inguinal hernia in adult men. In contrary to this firm opinion presented by the EHS, the Shouldice herniorrhaphy method is acceptable as well.³

The choice of the method of repair depends mainly on the experience of the surgeon. The ideal accepted method for modern hernia repair should be simple, safe, cost effective, tension free, with very low incidence of

recurrence. The Lichtenstein tension free mesh repair to a great extent achieves all these goals.⁴ The prostheses used to repair may create complications like discomfort and abdominal wall stiffness, which may influence everyday activities of the patient.⁵ Surgical-site infections are more frequent after insertion of mesh in the inguinal canal.⁶ Thus, inguinal hernia specialists are still far from accomplishing everything in the surgical secrets of hernia repair field and postoperative morbidity remains the major clinical problem. The observed complication rates and dysfunction following surgery have affected many surgeons to look for new hernia repair techniques or to modify successful old repair. In the beginning of the current century, a new standard surgical option for tissue-based groin hernia repair was first described by Mohan P. Desarda. The technique requires less complicated dissection or suturing, easy to learn and has similar results like Lichtenstein repair.^{7,8} In terms of recurrence, with the significant benefit of not introducing permanent foreign body material⁹. With this background this study was designed to evaluate the feasibility of Desarda tissue repair at a tertiary Hospital as treatment of primary inguinal hernia, by comparing it with Lichtenstein repair.

Materials and methods

A quasi-experimental study was done to compare the two techniques of hernia repair was carried out in the Department of Surgery, Chittagong Medical College Hospital. The proposed sample size was 50 in each group to address the hypothesis. The study group included male patients above 18 years of age undergoing Desarda Technique and Lichtenstein Mesh Hernioplasty for inguinal hernia repair. Study was conducted for a one-year period from February 2018 to January 2019. Pre-tested structured questionnaire was used. Patient admitted for routine hernia surgery or as emergency due to obstruction within 6 hours. Strangulated or incarcerated inguinal hernia, recurrent inguinal hernia, patients with any co-morbidities like COPD, BEP, Patients who refused active participation were excluded from the study. Informed written consent was obtained after explaining the details of the procedures with their advantages and disadvantages and it was ensured to them that there was no potential risk of this study. Every individual questionnaire was preserved with proper identification of the patient maintaining confidentiality.

Prior to data collection both verbal and informed written consent were taken from participants and the investigator himself collected data. The wound was checked on the third post-operative day. It was checked earlier if the dressing became soaked or if the patient

developed signs of wound infection. Patients were advised to attend outpatient clinics for removal of stitches on the 10th postoperative day. If any patient gets readmission after discharge with any complication, was included for observation in this study. All cases were selected according to inclusion criteria. Patient's particulars, other parameters and variables were recorded first in the case record form and a pre-designed SPSS data sheet. Prior to the commencement of this study, the research protocol was approved by the ethical committee.

Statistical analysis of the results was obtained by using window-based computer software device (SPSS-22). The numerical data were expressed as mean with Standard Deviation (\pm SD) and was compared using the student's t-test. The categorical data were expressed as number and percentage and were compared using the chi-square test. The results were presented in tables, figures and diagrams. Confidence Interval (CI) selected at 95% level.

Operational Definitions

Postoperative Wound Infection: Infection in the surgical site was followed within 30 days for non-prosthetic surgery and upto 1 year in case of prosthetic surgery.¹⁰

Seroma Formation: Seroma is due to an excessive inflammatory response to sutures or mesh and cannot be prevented. Usually occur on next week, in most cases the fluid resolves spontaneously but may require aspiration.¹⁰

Chronic Pain: Defined as moderate (VAS 3-5) or strong (VAS > 5) pain lasting more than 6 months after surgery.¹¹

Early Recurrence: Recurrence within 2 years of operation of primary inguinal hernia.¹²

Desarda Technique: An operation where a 1- to 2-cm strip of external oblique aponeurosis lying over the inguinal canal is isolated from the main muscle but left attached both medially and laterally. It is then sutured to the conjoint tendon and inguinal ligament, reinforcing the posterior wall of the inguinal canal. As the abdominal muscles contract, this strip of aponeurosis tightens to add further physiological support to the posterior wall.¹⁰

Lichtenstein Mesh Hernioplasty: A polypropylene Mesh is cut to cover the whole posterior wall of the canal and extend around the deep ring. There is no tension and sutures are only used to prevent early displacement before tissue ingrowth secures it in position. A Prolene running suture holds the lower edge

of the mesh to the inguinal ligament. An additional four to five sutures will prevent rolling of the edges of the mesh and can hold the cut edges of the mesh together again around the cord at the deep ring.¹³

All patients were operated on under spinal anesthesia and incision was oblique inguinal. An inguinal canal was opened along the direction of the fibers of EOA starting from superficial ring to 2 cm lateral to deep ring and precautions were taken to avoid injuries to ilioinguinal, iliohypogastric nerves. Spermatic cord was mobilized at the level of pubic tubercle and separated from inguinal ligament and cremasteric fibers were divided. The hernial sac was identified and dissected free from cord and cleared up to the level of deep ring. The sac was then twisted, transfixed and ligated with atraumatic prolene 2-0. Excess sac was excised 1 cm distal to ligature and complete hemostasis was achieved before dropping the sac back into the deep ring. Sac of small direct hernia was invaginated back. A very large sac was opened by scissors at fundus and contents were reduced and part of sac adhered to tunica is left in situ. After completion of herniotomy, repair of posterior wall was done by either Lichtenstein or Desarda technique.

All patients of both groups received a single dose of injectable antibiotic (amoxicillin + Clavulanic acid) before induction of anesthesia followed by oral antibiotics (Amoxicillin + Clavulanic acid) and analgesics for 7-10 days. All patients were closely monitored postoperatively.

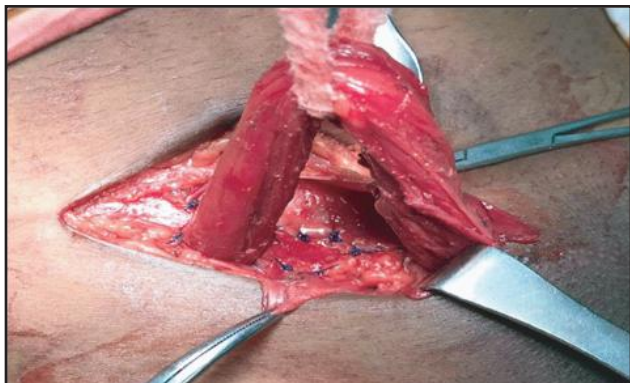


Figure 1 Undetached strip of EOA forming the new posterior wall of inguinal canal.

The lower cut margin of medial leaf of the EOA is sutured to the inguinal ligament from the pubic tubercle to the deep ring using 2/0 polypropylene interrupted sutures. Then a split incision was made in the same leaf of EOA keeping a desired strip of EOA as required. The upper cut margin of the strip is sutured to the conjoined tendon medially and internal oblique muscle laterally. The medial insertion and lateral continuity of this strip kept intact.

Results

Table I Distribution of the patients by age (n=100)

Age (Year)	Group-I (n=50)		Group-II (n=50)		p value
	n	%	n	%	
<30	7	14.0	1	2.0	
30-60	39	78.0	42	84.0	
>60	4	8.0	7	14.0	
Mean±SD	43.14±14.44		48.33±12.63		0.058 ^{ns}
Range (Min-max)	18-96		19-78		

ns= not significant (t= 1.92 < CV 1.98) (Unpaired t test). p value from unpaired t-test.

Table I shows more than three fourth (78.0%) patients belonged to age 30-60 years in group I and 42(84.0%) in group II. The mean age was 43.14±14.44 years in group I and 48.33±12.63 years in group II. The difference was statistically not significant (p>0.05) between two groups.

Table II Distribution of the patients by Co morbid illness (n=100)

CO morbid illness	Group-I (n=50)		Group-II (n=50)	
	n	%	n	%
IHD	0	0.0	3	6.0
T ₂ DM with HTN	0	0.0	2	4.0
HTN	1	2.0	4	8.0
T ₂ DM, HTN, IHD	1	2.0	0	0.0
T ₂ DM, IHD	1	2.0	0	0.0
IHD, HTN	2	4.0	2	4.0
T ₂ DM, HTN	3	6.0	1	2.0
T ₂ DM	5	10.0	7	14.0
Nil	37	74.0	31	62.0
Total	50	100.0	50	100.0

*IHD = Ischemic Heart Disease.

*HTN= Hypertension.

*T₂DM = Type II Diabetes Mellitus.

Table II shows 5(10.0%) patients had T₂DM in group I and 7(14.0%) in group II. Three (6.0%) patients had T₂DM, HTN in group I and 1(2.0%) in group II. Other findings are depicted in the above table.

Table III Distribution of the patients by types of inguinal hernia (n=100)

Types of inguinal hernia	Group-I (n=50)		Group-II (n=50)		p value
	n	%	n	%	
Direct	13	26.0	22	44.0	0.059 ^{ns}
Indirect	37	74.0	28	56.0	

ns= not significant ($\chi^2= 3.56$ CV = 3.84, So, not significant). p value reached from Chi-square test.

Table III shows 13(26.0%) patients had direct hernia in group I and 22(44.0%) in group II. The difference of type variation was statistically not significant ($p>0.05$) between two groups.

Table IV Location of the hernia among the patients (n=100)

Location of hernia by side	Group-I (n=50)		Group-II (n=50)		p value (n=50)
	n	%	n	%	
Right sided	26	52.0	26	52.0	0.942 ^{ns}
Left sided	19	38.0	18	36.0	
Bilateral	5	10.0	6	12.0	
Total	50	100.0	50	100.0	

ns= not significant, p value reached from Chi-square test.

Table IV shows more than half (52.0%) patients had right sided hernia in group I and 26(52.0%) in group II. The differences by location of hernia in two groups not varied significantly.

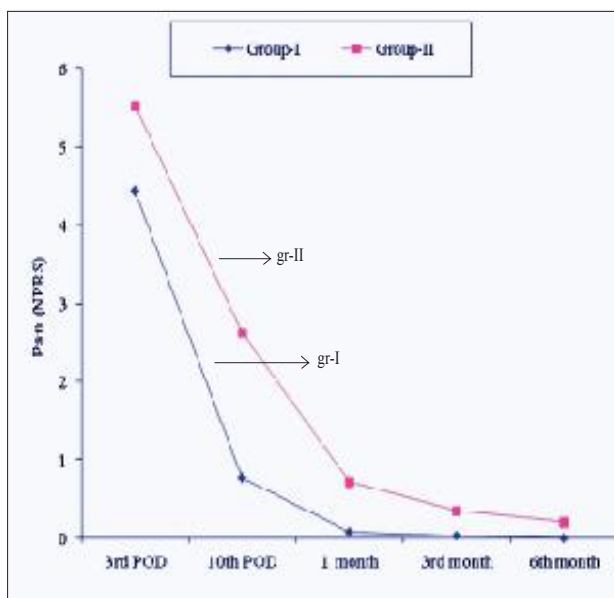


Figure 2 Mean pain (NPRS : Numeric Pain Rating Scale) of the study patients at different follow up (n= 100)

On 3rd POD it was 4.44±0.97 in group I and 5.52±0.71 in group II. It was 0.76±1.02 in group I and 2.62±1.21 in group II at 10th POD. The mean 1 month pain (NPRS) was 0.08±0.27 in group I and 0.72±0.7 in group II. It was 0.02±0.14 in group I and 0.34±0.48 in group II in the 3rd month. The mean 6th month pain (NPRS) was 0.2±0.45 in group I, absent in group- I. The difference was statistically significant ($p<0.05$) between two groups. (Unpaired t test).

Table V Seroma formation in two groups at different post operative follow up (n=100)

Seroma	Group-I (n=50)		Group-II (n=50)		p value
	n	%	n	%	
3rd POD					
Present	0	0.0	1	2.0	0.314 ^{ns}
Absent	50	100.0	49	98.0	
10th POD					
Present	5	10.0	5	10.0	1.000 ^{ns}
Absent	45	90.0	45	90.0	
1 month					
Present	0	0.0	0	0.0	
Absent	50	100.0	50	100.0	
3rd month					
Present	0	0.0	0	0.0	
Absent	50	100.0	50	100.0	
6th month					
Present	0	0.0	0	0.0	
Absent	50	100.0	50	100.0	

ns= not significant, p value reached from Chi square test.

Table V shows that 5(10%) patients had 10th POD seroma in group I and 5(10%) in group II of patients. After 10th POD there was no seroma formation in both the groups. The difference was statistically not significant ($p>0.05$) between two groups.

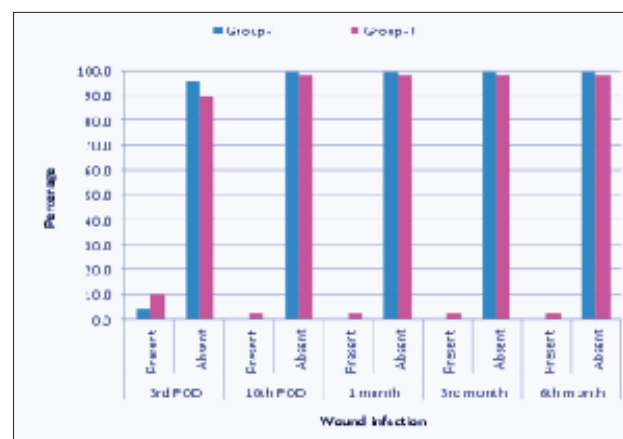


Figure 3 Wound infection percentage among the patients after operation (n= 100)

This depicted from the figure that wound infection was found in 2 (4%) cases in group-I and 5(10%) cases in group-II after 3rd POD. One case found in each of the observation of 10th POD, 1month POD, 3rd month POD and 6th month POD among the group-II respondents.

Discussion

This study found 26.0% patients had direct hernia in group I and 44% in group II. Indirect hernia was found 74% and 56% in group I and group II respectively. The difference was statistically not significant ($p>0.05$) between two groups. Neogi et al. study showed 20.8% had Direct hernia in group I and 8.5% in group II.¹⁴ Indirect hernias were observed 79.2% and 91.5% in group I and group II respectively. Similar observations regarding the types of hernia were also observed by Zulu et al.¹⁵

It was observed that 52% patients had right sided hernia in group I and 52% in group II. Left side was cases were 38% and 36% in group I and group II respectively. Bilateral was found 10% in group I and 12% in group II. Location of hernia was almost alike between two groups, no statistically significant ($p>0.05$) difference was found between two groups. Ahmed et al. study observed that 60% had right sided hernia in group I and 63.1% in group II. Left sided hernia found 32.3% in group I and 27.7% in group II.¹⁶ Bilateral hernia showed 7.7% and 9.2% in group I and group II respectively.

In this current study, it was observed that 22 (44%) patients had 3rd POD pain (NPRS) in group I and 16 (36%) in group II. The mean 3rd POD pain (NPRS) was $4.44\pm.97$ in group I and $5.52\pm.71$ in group II. 26 (52%) patients had 10th POD pain (NPRS) in group I and 1(2%) in group II. The mean 10th POD pain (NPRS) was $0.76\pm.02$ in group I and $2.62\pm.21$ in group II. 46 (92%) patients had 1 month pain (NPRS) in group I and 21(42%) in group II. The mean 1 month pain (NPRS) was $0.08\pm.27$ in group I and $0.72\pm.7$ in group II. 49 (98%) patients had 3rd month pain (NPRS) in group I and 33(66%) in group II. The mean 3rd month pain (NPRS) was $0.02\pm.14$ in group I and $0.34\pm.48$ in group II. All patients after 6th month had no pain (NPRS) in group I and 41(82%) in group II. The mean 6th month pain (NPRS) was $0.2\pm.45$ in group II.

Pain (NPRS) was significantly ($p<0.05$) higher in group II in 3rd POD and all subsequent follow-ups. Vupputuriet al. study showed that on VAS scale on day 1, 2, and 3 after the surgery was found significantly higher ($p<0.001$) in group II than group I.¹⁷ Ahmed et al. reported that, the assessment of postoperative pain at day 1 and day 7 showed that Desarda group had significantly lower pain score than Liechtenstein group.¹⁶ However, there were no significant pain difference between both groups after 6 months.

It was observed that in 3rd POD, no patients had seroma in group I and 1(2%) found in group II. Seroma found 5(10%) at 10th POD in group I and 5(10%) in group II. The difference was statistically not significant ($p>0.05$) between two groups. Seroma did not present in any group in subsequent follow-up. Rodriguez et al. showed seroma had 0.7% in group I and 1.3% in group II.¹⁸ There was less incidence of seroma formation in group I, in Neogi et al. study, 8.33% in group I compared to 25.53% in group II which was found statistically significant.¹⁴

It was observed that 2(4%) of patients had 3rd POD wound infection in group I and 5(10%) in group II. 1(2%) patient had wound infection in group II at 10th POD and subsequent follow up but none in group I. Wound infection was comparatively higher in group II but the difference was not significant ($p>0.05$) between two groups. Neogi et al. study found that wound infection was 6.25% in group I and 10.6% in group II which is consistent with the current study.¹⁴ Similar observations regarding the wound infections were also observed by Gondal et al. and Rodriguez et al.¹⁸

Recurrence was not observed in any group in any follow-up during the study period. Deysine et al. suggested that the technique has a 1% recurrence rate when performed by experienced surgeons.²⁰ Ahmed et al. mentioned that about recurrence rate, there was one recurrence in Lichtenstein group versus no recurrence in Desarda group.¹⁶ However, no significant recurrences between both groups were detected in their study and similar findings were also observed by Youssef et al. Szopinski et al.^{21,11}

Limitations

The study populations were selected from a hospital in Chattogram city, so that the results of the study may not reflect the exact picture of the country. The present study was conducted in a very short period. Small sample size was also a limitation of the study. The surgery was done by multiple surgeons.

Conclusion

The result of this study supports the use of Desarda repair in the hospitals as the method of choice for most of the patients as it is easy to perform with less tissue dissection unlike Bassini or Shouldice. Desarda's no mesh technique can potentiate the tissue-based techniques. It strengthens the posterior inguinal wall physiologically and obviously doesn't require any foreign body like mesh. It is cost effective too. 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 for inguinal hernia repair.

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Disclosure

All the authors declared no conflicts of interest.

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