

Original Research Article

Comparison of outcome of Desarda versus Bassini repair in management of complicated inguinal hernia

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Received: 10 September 2019

Revised: 01 October 2019

Accepted: 02 October 2019

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ABSTRACT

Background: Complicated inguinal hernia is a common problem faced by surgeons across the world. Various methods of surgical repair have been described. It is important to identify the best repair technique of inguinal hernia to have better post-operative outcome.

Methods: This randomised controlled study consisted of 84 cases of complicated inguinal hernias presenting to surgical emergency department of Maulana Azad Medical College. Patients were randomly allocated to two repair groups- Desarda and Bassini and various intra/post-operative parameters were compared.

Results: Duration of surgery and postoperative pain scores were less in Desarda group. Time to return to strenuous daily activities was also less with Desarda repair. Desarda repair was associated with less incidence of chronic inguinodynia and post-operative complications.

Conclusions: Desarda repair was found to be superior to Bassini group due to shorter duration of surgery. Patients required less analgesics following Desarda repair as compared to Bassini group. There was no recurrence in any group at four months follow up.

Keywords: Inguinal hernia, Herniorrhaphy, Desarda, Bassini, Visual analogue scale, Inguinodynia

INTRODUCTION

Of all the types of abdominal wall hernias, inguinal hernias are most common subtype.¹ Surgeons across the world are repairing inguinal hernia as most commonly encountered surgery.² In USA and Europe approximately one million inguinal hernia repairs are done annually and the situation is likely to be same in India.³ Hernia surgery has evolved through ages. One can say that the history of hernia repair is the history of surgery.⁴ Many era has dawned in the history of inguinal hernia repair but none matched the results published by Edoardo Bassini, that fetched him the title of “Father of modern herniorrhaphy”. The use of mesh in potentially contaminated operating field is not advisable.⁵ Infections

and their subsequent consequences have restricted the use of mesh in emergency settings. Mesh repair is not available in every part of the world and it increases the cost of the operation.⁶ The current World Society of Emergency Surgery recommends direct suture based repair for contaminated emergency hernia fields.⁵ Bassini repair has stood the test of time in this regard. In 2001, Pune based Indian Surgeon Dr. Desarda, introduced a new novel technique of a tissue- based hernia repair without mesh with almost zero recurrence rates.⁷ Moreover, as reported by Dr. Desarda, the technique requires no complicated dissection or suturing, no mesh is needed and is easy to learn.^{8,9} Desarda’s no mesh technique is easy to learn and simple when compared to other no mesh repair techniques and requires

no mesh.¹⁰ The present study was carried out to compare the results of Bassini's repair with the Desarda's repair in the management of complicated inguinal hernia cases.

METHODS

It was a randomized controlled study, conducted in the Department of Surgery, Maulana Azad Medical College and Lok Nayak Hospital, New Delhi, from September 2017 to April 2019. The study population consisted of cases of complicated inguinal hernias presenting to Emergency of General Surgery, Lok Nayak Hospital, New Delhi.

Inclusion criteria

All male patients more than 18 years with complicated inguinal hernias (irreducible, obstructed, and strangulated) presenting to the surgical emergency of Lok Nayak Hospital were included in the study.

Exclusion criteria

Exclusion criteria were patients under 18 year's age; patients deemed unfit for spinal or general anesthesia; presence of local skin infection; patient requiring laparotomy during primary surgery or at any other stage later on; patients with recurrent hernia.

Primary outcome

Primary outcome of the study was chronic inguinodynia, which was defined as the persistence of pain, heaviness, stiffness or foreign body sensation at the operative site 3 months after the surgery.

Secondary outcome

Secondary outcomes noted were post-operative pain, short term recurrence (at the end of 4 months), post-operative complications including hematoma, scrotal edema, surgical site infection, epididymo-orchitis.

Sampling method

It was a randomized controlled trial in which two groups were created on the basis of computer generated random numbers. 84 envelopes were made with numbers from 1-84. Patients were allocated to following two groups:

- Group A- Desarda repair.
- Group B- Bassini's repair.

Randomization was done by computer generated random number tables. On moving right on the random number table every number thus encountered was placed in alternate groups.

The envelopes were concealed. For every patient an envelope was selected and opened just before the repair.

The work up of the patients was divided into pre-operative evaluation, operative procedure and post-operative monitoring and follow up.

Informed consent was taken from all subjects eligible for the study before enrolment. All patients were given the option of opting out of the trial any time during the study period.

All the patients were resuscitated adequately and nasogastric decompression was done in obstructed and strangulated hernias. Preoperative part preparation was done from umbilicus to mid-thigh. Injectable amoxicillin and clavulanic acid 1.2 gm was given before skin incision and were continued for 5 days in cases of obstructed and strangulated hernias. In case of bilateral hernias, each side was assessed independently in terms of chronic inguinodynia, complications and short-term recurrence. All data was divided into 3 subgroups i.e. irreducible, obstructed and strangulated for the purpose of analysis.

Intraoperative evaluation was made by noting operative procedure done, type of anesthesia, operating time (skin to skin), intra-operative findings and type of inguinal hernia- direct/indirect/sliding and post-operative pain charting using visual analogue scale (VAS). Post-operative pain scores were determined at 6 hours, 24 hours, 1 week, 3 weeks and 3 months after the surgery.

Operative procedure

All cases were opened through the groin incision. The viability of the gut was checked. In case of gangrene, all the non-viable part of the bowel was removed and a single layer, full thickness, end to end anastomosis using silk 3-0 suture with interrupted sutures was done through the same incision. After addressing the bowel, definitive repair- Desarda or Bassini was done.

In post-operative monitoring and follow up all patients received inj. diclofenac 75 mg after the surgery, for 3 days and thereafter on need basis. Patient was discharged on oral analgesics on need basis and patients were told to record all analgesic requirement, which was documented on the specified visits. A VAS>4 was taken as a reference for analgesic requirement. Early ambulation for daily routine activities was encouraged. Patients were discharged whenever they were able to accept orally and could walk with ease. Patients were asked to visit the O.P.D. on 7th day, 21st day and 3 months and 4 months after the surgery. Patients were also advised to maintain local hygiene and to avoid lifting heavy weight.

Parameters for comparison

Analgesic requirement above the basic set dosage, duration of hospital stay and time to return to daily routine activities, time to return to work (defined as return to strenuous activities of daily life), presence of chronic groin pain/ chronic inguinodynia (pain,

heaviness, stiffness or foreign body sensation at the operative site 3 months after the surgery), post-operative complications like bleeding/seroma/hematoma/scrotal edema, surgical site infection(superficial or deep) as defined in the Centre for Disease Control (CDC) guidelines.¹¹ Recurrence at 4 months and Quality of life measurement by Short Form 6-D (SF 6-D) questionnaire.

Statistical analysis

All data was transferred and entered in MS Excel sheets and analysis was done. Statistical analysis was performed by the SPSS program for Windows, version 17.0 (SPSS, Chicago, Illinois).

Continuous variables were presented as mean±SD, and categorical variables was presented as absolute numbers and percentage. Data was checked for normality before statistical analysis. Normally distributed continuous variables were compared using the unpaired t test, whereas the Mann-Whitney U test was used for those variables that are not normally distributed. Categorical variables was analysed using either the Chi-square test or

Fisher’s exact test. For all statistical tests, a p value less than 0.05 was taken to indicate a statistically significant difference.

RESULTS

A total of 84 patients clinically diagnosed as complicated inguinal hernia were included in the study. All the enrolled 84 patients underwent hernia repair in emergency operation theatre, 42 as Bassini repair and 42 as Desarda repair. However, two patients from Bassini group and one patient from Desarda group were excluded from the study due to conversion to laparotomy. Finally, the data for remaining 81 cases were analysed and following observations were noted.

Age distribution

All the patients included in the study were 18 yrs of age or above. The two groups were comparable in terms of age distribution as the p=0.68 which was statistically not significant (Table 1).

Table 1: Age wise distribution of cases in the study.

| Age group (years) | Desarda repair group (n=41) | | Bassini repair group (n=40) | | Total (n=81) | |
|-------------------|-----------------------------|------|-----------------------------|------|--------------|-------|
| | No. | % | No. | % | No. | % |
| 18-30 | 15 | 26.4 | 4 | 10.0 | 19 | 23.46 |
| 31-45 | 8 | 18.2 | 12 | 30.0 | 20 | 24.69 |
| 46-60 | 7 | 18.2 | 8 | 20.0 | 15 | 18.52 |
| >60 | 11 | 27.3 | 16 | 40.0 | 27 | 33.33 |

P=0.68; chi-square value=0.55.

Gender distribution

All the patients included in this study were males.

Clinical characteristics of the patients

Right sided inguinal hernia was more common compared to left sided hernia in the present study and accounted for 61.9% of the cases. The two groups were comparable in terms of side of the hernia as the p value was calculated to be 0.38, which was statistically significant.

Indirect hernias were the most commonly seen type in both the groups, forming 85.8% of all the cases. The Bassini group comprised of 40 cases of indirect hernias, while the Desarda group included 38 cases of the indirect hernia. In Bassini group, there was no case of direct hernia compared to the Desarda group which included 3 cases of direct hernia. The two groups were comparable in terms of the types of inguinal hernia, as the p value was found to be 0.68, which was statistically insignificant (Table 2).

Table 2: Clinical characteristics of the cases in Desarda and Bassini’s groups.

| Inguinal hernia | | Desarda repair group (n=41) | | Bassini’s repair group (n=40) | | Total (n=81) | | P value |
|-----------------|----------|-----------------------------|-------|-------------------------------|-------|--------------|-------|---------|
| | | No. | % | No. | % | No. | % | |
| Side | Left | 11 | 26.83 | 20 | 50.0 | 31 | 38.27 | 0.38 |
| | Right | 30 | 73.17 | 20 | 50.0 | 50 | 61.73 | |
| Type of hernia | Direct | 3 | 7.3 | 0 | 0.0 | 3 | 3.71 | 0.68 |
| | Indirect | 38 | 92.68 | 40 | 100.0 | 78 | 96.29 | |

Table 3: Comparison of operating time in Desarda and Bassini’s groups.

| | Desarda repair group (n=41) | Bassini’s repair group (n=40) | P value |
|-------------------------------------|--------------------------------|----------------------------------|---------|
| Time (in minutes) (Mean ±SD) | 102.73±24.22 | 133.00±28.69 | 0.02 |

Table 4: Comparison of post-operative pain scores in Desarda and Bassini’s groups.

| Post-operative VAS score for pain | Desarda repair group (n=41) | | Bassini’s repair group (n=40) | | P value |
|-----------------------------------|--------------------------------|------|----------------------------------|------|---------|
| | Mean | SD | Mean | SD | |
| At 6 hours | 3.45 | 1.57 | 5.40 | 0.96 | 0.01 |
| At 24 hours | 1.82 | 1.08 | 3.20 | 1.03 | 0.02 |
| At 1 week | 0.55 | 0.93 | 0.80 | 1.03 | 0.65 |
| At 3 weeks | 0.0 | 0.0 | 0.0 | 0.0 | - |
| At 3 months | 0.0 | 0.0 | 0.0 | 0.0 | - |

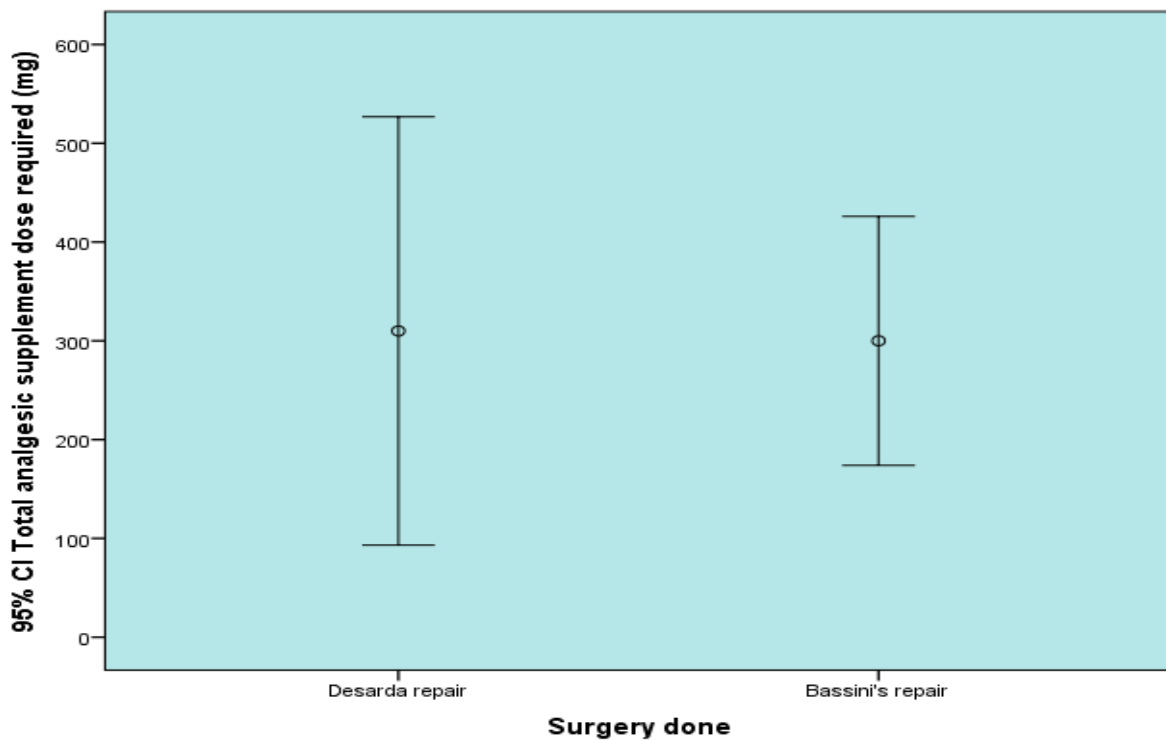


Figure 1: Error plot showing total analgesic supplement dose required post-operatively.

Duration of surgery

The duration of the surgery in each case was calculated from the time of skin incision to the last skin suture. The mean operating time in Bassini group was 133.00±28.69 minutes. The maximum operating time in Bassini group was 3 hours and the minimum duration was noted to be 1 hour 30 minutes. The mean operating time in the Desarda group was found to be 102.73±24.22 minutes. The maximum operating time in Desarda group was 2 hour 30 minutes and the minimum operating time was found to be 1 hour 15 minutes. The mean operating was found to be less in the Desarda group in comparison to Bassini group, with p=0.02, thus this difference was statistically significant (Table 3).

Post-operative pain scores

Pain scores were measured in the post-operative period at different time intervals using the ten point VAS. The pain scores in each case were measured at 6 hours, 24 hours, 1 week, 3 weeks and 3 months after the surgery. The mean score at 6 hours was 3.45±1.57 for the Desarda group as compared to 5.40±0.96 for the Bassini group, showing lower score in Desarda group, with p value of 0.01 which was statistically significant. The mean scores at 24 hours was 1.82±1.08 for Desarda group as compared to 3.20±1.03 for Bassini group, showing lower score in Desarda group, with p value of 0.02, which was statistically significant. The mean score at 1 week was 0.55±0.93 for Desarda group as compared to 0.80±1.03

for Bassini group, showing fall in pain scores in both the groups, with greater fall in Bassini group, with p value of 0.65, which was statistically insignificant. The mean score at 3 weeks and at 3 months was 0 in both the groups (Table 4).

Post-operative analgesic requirement

All the patients received injectable diclofenac 75 mg intravenously just after the surgery, at 8 PM on the day of surgery and then two times a day for 3 consecutive days. Any additional requirement was recorded. All the patients were discharged on oral diclofenac 50 mg on requirement basis and the patient was told to record all the analgesic intake. The total dose of additional analgesic requirement was calculated to be 310.00±174.64 mg in the Desarda group and 300.00±163.93 mg. The p value for this difference was calculated to be 0.89, which was statistically insignificant (Figure 1).

Hospital stay and time to return to normal daily routine activities

In the present study patients were discharged whenever they were able to take orally and were able to walk with ease and could perform their daily routine activities without discomfort. The mean hospitalization day was 4.36±4.88 days in Desarda group as compared to 3.10±0.99 days in Bassini group. The p value calculated was 0.97, thus this was statistically insignificant (Table 5).

Time to return to work

In this study time to return to work was defined as the time to return to strenuous activities of daily life. The mean time noted in the Desarda group was 9.45±2.42 days as compared to 12.5±1.70 days in Bassini group. The p value calculated was 0.01, which was statistically significant (Table 6).

Table 5: Comparison of hospital stay and time to return to normal daily routine activities in Desarda and Bassini’s groups.

| Variable | Desarda repair group (n=41) | | Bassini’s repair group (n=40) | | P value |
|----------------------|-----------------------------|------|-------------------------------|------|---------|
| | Mean | SD | Mean | SD | |
| Hospital stay (days) | 4.36 | 4.88 | 3.10 | 0.99 | 0.97 |

Table 6: Comparison of time to return to work in Desarda and Bassini’s groups.

| Variable | Desarda repair group (n=41) | | Bassini’s repair group (n=40) | | P value |
|-------------------------------|-----------------------------|------|-------------------------------|------|---------|
| | Mean | SD | Mean | SD | |
| Time to return to work (days) | 9.45 | 2.42 | 12.50 | 1.70 | 0.01 |

Table 7: Comparison of post-operative complication rates between Desarda and Bassini’s groups.

| Postoperative complications | Desarda repair group (n=41) | | Bassini’s repair group (n=40) | | Total | | P value |
|------------------------------|-----------------------------|------|-------------------------------|------|-------|------|---------|
| | No. | % | No. | % | No. | % | |
| Bleeding from suture site | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | - |
| Scrotal edema | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | - |
| Seroma or hematoma formation | 7 | 18.2 | 12 | 30.0 | 19 | 23.8 | 0.63 |
| Surgical site infection | 8 | 18.2 | 12 | 30.0 | 20 | 23.8 | 0.63 |
| Total | 15 | 36.4 | 24 | 60.0 | 39 | 47.6 | 0.39 |

Complications

In this study the overall complication rate was higher in the Bassini group as compared to the Desarda group. None of the case in either group suffered from any intraoperative complications. Post-operatively, a total of 15 complications were noted in Desarda group (36.4%) as compared to 24 complications in Bassini group (60%). The p value for this difference was calculated to be 0.39, which was statistically insignificant. Seroma formation and surgical site infection were the complications noted

in both the groups. 7 cases in Desarda group (18.2%) and 12 cases in Bassini group (30%) developed seroma, and the p value for this difference was calculated to be 0.63 which was statistically insignificant. 8 cases in Desarda group (18.2%) and 12 cases in Bassini group (30%) developed surgical site infection, and the p value for this difference was 0.63, which was statistically insignificant. None of the patients in either group suffered from scrotal edema, bleeding from suture site, in the post-operative period (Table 7).

Chronic inguinodynia

In the current study, chronic inguinodynia was defined as any pain, stiffness in the inguinal region or foreign body sensation persisting at 3 months post-operatively. A total of 15 patients (19%) experienced chronic inguinodynia. 3 patients in Desarda group (7.31%) developed chronic inguinodynia as compared to 12 patients in Bassini group (30%). The p value for this difference was calculated to be 0.31, which was statistically insignificant (Table 8).

Short term recurrence at 4 months

In our study none of the patients in either group had recurrence at 4 months of follow up, however long term studies are required to find out the actual incidence of recurrence.

Quality of life

In our study quality of life was measured post-operatively at 1 month by using short-form six-dimension (SF-6D) questionnaire for all the patients in both Desarda and Bassini group. SF-6D questionnaire is a derivative of SF-

36, composed of 6 multilevel dimensions.¹² Out of these 6 dimensions in SF-6D questionnaire, we found a statistically significant difference in 2 of these dimensions, namely physical functioning and role limitation. The p value for this difference in physical functioning was found to be 0.02, and for role limitation it was found to be 0.01. Physical limitation as estimated by questionnaire was found to be better in Desarda group (Table 9).

Cost analysis

As the study was conducted in government hospital and the treatment provided was free of cost, we calculated the cumulative cost of the suture materials used in the procedures. The average cost of the procedure in Desarda group was found to be Rs. 1000, including the cost of one polydioxanone suture, one vicryl and one nylon suture. In Bassini group, the average cost of the procedure was calculated to be 1000, including the cost of one prolene suture, one vicryl and one nylon suture. There was no difference in cost in terms of cost of suture material, however the patients of Desarda repair were discharge one to two days earlier than patients of Bassini repair thereby reducing the overall cost.

Table 8: Comparison of stiffness in groin at 3 months follows up in Desarda and Bassini’s groups.

| Variables | Desarda repair group (n=41) | | Bassini’s repair group (n=40) | | Total | | P value |
|--------------------------------|-----------------------------|------|-------------------------------|------|-------|-------|---------|
| | No. | % | No. | % | No. | % | |
| Stiffness in groin at 3 months | 3 | 7.31 | 12 | 30.0 | 15 | 18.51 | 0.31 |

Table 9: Comparison of post-operative SF-6 scores in Desarda and Bassini’s groups.

| SF-6 dimensions | Desarda repair group (n=41) | | Bassini’s repair group (n=40) | | P value |
|----------------------|-----------------------------|------|-------------------------------|------|---------|
| | Mean | SD | Mean | SD | |
| Physical functioning | 1.18 | 0.60 | 1.80 | 0.63 | 0.02 |
| Role limitation | 1.18 | 0.40 | 1.80 | 0.42 | 0.01 |
| Social functioning | 1.09 | 0.30 | 1.40 | 0.52 | 0.25 |
| Pain | 1.45 | 0.68 | 1.60 | 0.52 | 0.51 |
| Mental health | 1.0 | 0.0 | 1.0 | 0.0 | 1.0 |
| Vitality | 1.27 | 0.47 | 1.60 | 0.69 | 0.35 |

DISCUSSION

The patients were divided into two groups, one group underwent Desarda repair (tension free mesh free tissue repair) while the other group underwent Bassini repair. However, 2 patients from Bassini group and 1 patient from Desarda group were excluded from the study due to conversion to laparotomy.

All the patients in this study were males. Right sided inguinal hernia was more common compared to left sided hernia in this study, in both the groups. Overall, 62% of the cases involved in the study had right sided hernia. This observation also correlated with the other study.⁶

Inguinal hernia are found to be more common on the right side as the right side testis descends late as compared to left side, hence the chances of patent processus vaginalis on the right side are more.¹³ The two groups were comparable in terms of side of hernia as the p value was calculated to be 0.38, which was statistically insignificant.

Indirect hernias are twice as common as direct hernias.¹⁴ In this study indirect hernias were most commonly seen type in both the groups 85.8% of all the cases. Overall the two groups were comparable in terms of the type of inguinal hernia, as the p value was calculated to be 0.68, which was statistically insignificant. Our study has

similar findings in terms of the type of hernia in comparison with other study.⁶ In all the cases of indirect hernias, point of obstruction was found to be at deep inguinal ring.

The duration of surgery was calculated from the time of the skin incision given to the last skin suture taken. The mean operating time in the Desarda group was 102.73±24.22 minutes. The mean operating time in the Bassini group was found to be 133±28.69 minutes. Papaziogas et al had 91.5±9.3 minutes as mean time in Bassini repair.⁶ Naveen, et al showed mean time of 47.11±7.51 minutes in Bassini group.⁷ Youssef et al had mean time of 59.4±6.3 minutes in Desarda group.¹⁵ Mitura, et al had mean time of 56.6 minutes for Desarda group.¹⁶

The mean operating time for Bassini repair was found to be higher in our study in comparison to previous reported studies. The difference can be explained by the fact that we included only complicated inguinal hernia cases in the study while in other studies they were excluded.

The mean VAS pain scores at 6 hours, 24 hours, 1 week and 3 weeks were 3.45±1.57, 1.82±1.08, 0.55±0.93 and 0 respectively for the Desarda group as compared to 5.40±0.96, 3.20±1.03, 0.80±1.03 and 0 respectively for the Bassini group. The pain scores were lower in the Desarda group as compared to Bassini group, which can be attributed to lesser dissection and more physiological nature of the repair. The mean pain scores at 6 hours and 24 hours were statistically significant as the p value was 0.01 and 0.02 respectively. However, there was no statistically significant difference in mean pain score at 1 week. Naveen et al had mean pain scores of 1.24±0.96 for Bassini group.⁷ VAS scores in Youssef et al, study at 1 week, was 1.4±1.2 for Desarda repair.¹⁵ According to Szopinski et al, pain scores were more on 7th and 30th day in the Desarda group.¹⁷

The mean hospitalization time was 4.36±4.88 days in the Desarda group as compared to 3.10±0.99 days in the Bassini group. In studies conducted by Papaziogas et al and Naveen et al mean hospital stay was 10.3±3.4 days and 3.97±1.92 days respectively for Bassini repair.^{6,7} Desarda et al had Mean hospitalization time of 1.22±0.89 days in Desarda group.¹⁸ Mean hospitalization time was 29 hours in the Desarda repair and only 5 patients needed hospitalization for more than 3 days in the study done by Rodriguez et al.¹⁹

The mean time to return to work noted in Desarda group was 9.45±2.42 days as compared to 12.50±1.70 days in the Bassini group. The p value was calculated to be 0.01 which was statistically significant.

Overall complication rates following Bassini repair was 11.9% in Bassini repair in study conducted by Papaziogas et al.⁶ According to Naveen et al 5.7% in Bassini group developed hematoma and 8.6% developed seroma.⁷ As

per Szopinski et al.¹⁷ None of the patients in Desarda group developed seroma at the 30 day follow up. Youssef et al showed incidence of post-operative complication rate of 11.26% in Desarda group.¹⁵ Over all post-operative complication rate was 3.4% in Desarda group-Rodriguez et al.¹⁹

Chronic inguinodynia was defined as any pain, stiffness in the inguinal region or foreign body sensation persisting at 3 months post-operatively. In study conducted by Desarda et al, none of the patients experienced chronic inguinodynia in Desarda group at the end of 1 year.¹⁸ As per Rodriguez et al no patients in Desarda groups experienced chronic pain.¹⁹ According to Youssef et al after 6 months, 4 patients (5.6%) in the Desarda group experienced pain.¹⁵ The incidence of foreign body sensation was 60.6% in Desarda group, one year after the surgery.

In our study there were no recurrences in either group. Study by Papaziogas et al showed two patients in Bassini group had recurrence (2/42, 4.7%).⁶ Naveen et al had 2 recurrences in Bassini group (2/35, 5.7%).⁷ Study by Desarda et al showed no recurrence in Desarda group.¹⁸ But as per Szopinski et al, 2 patients had recurrence in Desarda group (1.9%).¹⁷

CONCLUSION

Desarda repair was found to be superior to Bassini repair due to shorter duration of surgery. Incidence of chronic inguinodynia was found to be much less in Desarda group. Patients required less analgesic supplement following Desarda repair as compared to Bassini repair. Desarda repair was found to be superior to Bassini repair due to shorter hospital stay and less time to return to work and strenuous activities of daily life. Quality of life was better following Desarda repair as compared to Bassini repair. However Desarda repair is slightly more expensive than Bassini repair.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Ansari FM, Hameed T, Jain SK, Dua A, Nizam A. Comparison of outcome of Desarda versus Bassini repair in management of complicated inguinal hernia. *Int Surg J* 2019;6:3889-96.