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Original Research Article

Tension free, mesh free inguinal hernia repair: a prospective study of Desarda's technique

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ABSTRACT

Background: The Desarda repair for inguinal hernias is a new tissue-based technique. Application of the external oblique muscle aponeurosis in the form of un-detached strip has been established as a new concept in tissue-based hernia repair.
Methods: A prospective study was conducted among 126 cases with 148 inguinal hernias repaired by Desarda's technique for a period of 3 years in Dr. B. R. Ambedkar Medical College and Hospital, Bangalore, Karnataka, India. The details pertaining to duration of hospital stay, pain, ambulation and complications were recorded.
Results: The mean age of the patients was 38.4 years. Mean operating time was 62.5 min for unilateral and 123 min for bilateral hernias. About 97.8% patients were ambulatory within 6.42 hours and were freely mobile within 19.26 hours after surgery. About 96.4% patients returned to work within 6-14 days. About 91.26% patients were discharged on same day. The mean hospital stay duration of the patients was 1.11 days. Postoperative pain on movement out of bed was described as mild and tolerable in 92.6% patients on day 1. Two patients had seroma that subsided on its own. There were no long-term complications, recurrence of the hernias or chronic groin pain.
Conclusions: The results of this new technique (Desarda repair) using continuous absorbable sutures appear promising. The continuous suturing saves time and just one packet of suture material without mesh saves cost.

Keywords: Desarda's repair, Inguinal hernia repair, Physiological repair

INTRODUCTION

The inguinal hernia is the most common hernia in men and women but much more common in men.[1] Estimated lifetime for inguinal hernia is 27% for men and 3% for women.[2] Inguinal hernia repair is one of the most common surgical procedures performed worldwide.[3] Lichtenstein repair is the most commonly performed operation in the developed world. Lichtenstein mesh repair, however, has its own shortcomings that include recurrences (1-15%), inguinodynia, chronic groin sepsis that requires mesh removal, cost, non-availability in many parts of the developing world, and tendency to fold or wrinkle (foreign body sensation).[4] Because of the observed complications and postoperative dysfunctions, many investigators look for new hernia repair. Efforts were made to develop a technique which is more physiological, avoids foreign body such as mesh and specifically reduces the recurrence rate and inguinodynia. An example of such an effort is the Desarda method, which was presented in 2001 and became a new surgical option for tissue-based groin hernia repair.[5] In this technique a strip of external oblique aponeurosis was used for strengthening of the posterior wall alternative to a prosthetic mesh. It is a simple, safe, tension free, mesh free, cost effective repair. Thus we are presenting our experience in treating inguinal hernias with Desarda's technique using continuous absorbable suture in order to

save time, reduce cost and also to avoid mesh related complications.

METHODS

A prospective study was conducted on 126 cases with 148 inguinal hernias repaired by Desarda technique from 2014 April to 2017 April in Dr. B. R. Ambedkar Medical College and Hospital. All patients aged between 18 - 60 years, uncomplicated or complicated inguinal hernias and those operated under spinal or local anesthesia were included in this study.

Old and debilitated patients of poor general condition, ASA grade III or more, recurrent hernias, laparoscopic repairs or the patients given general anesthesia for any reason and those who did not agree to participate were excluded from the study. All patients were properly counseled and an informed written consent was obtained from each patient. An intravenous antibiotic was administered intraoperatively in all cases. Oral analgesics were given to all the patients for 3 days, after which oral or parenteral analgesics were given only on demand. The patients were evaluated daily during their stay in the hospital. The details pertaining to duration of hospital stay, pain, ambulation and complications recorded during the operations or the hospital stay were obtained in a predesigned proforma. Visual analogue scale was used to measure the intensity of pain was graded as 0-30 mm signifying mild pain, 31-60 mm, moderate pain, 61-90 severe pain and 91-100 excruciating pain. The patients were advised either limited ambulation within the room, free movements outside the room and no movements restricted to bed.

The follow-up schedule was explained to the patient at the time of discharge and was scheduled after 7 days for suture removal, at 1 month, 6 months, and then, yearly. The patients were evaluated in detail and the data recorded at each assessment. The entire data were collected and analyzed at the end of the study. Patients are followed up till date (in OPD or telephonically). The recurrence of hernia was indicated by the appearance of a bulge upon coughing.

Operative technique

Skin and fascia were incised through regular, oblique inguinal incision to expose the external oblique aponeurosis (EOA). The thin filmy fascial layer is kept undisturbed as far as possible. The external oblique muscle was cut along with the upper crux of the superficial ring leaving thin portion within the lower lead and a strip was taken from the upper leaf. The cremastric muscle was then incised for herniotomy and funiculus alongside the cremastric muscle was separated from the inguinal floor. In the cases of indirect hernia, the sac was excised.

Suturing was done by using PDS no 1 absorbable continuous suture for the upper leaf of the EOA from the pubic tubercle to internal ring (Figure 1). The first to sutures were taken in the place where anterior rectus sheath joining external oblique aponeurosis. The last suture is taken so as to narrow the internal ring sufficiently without constricting the spermatic cord.

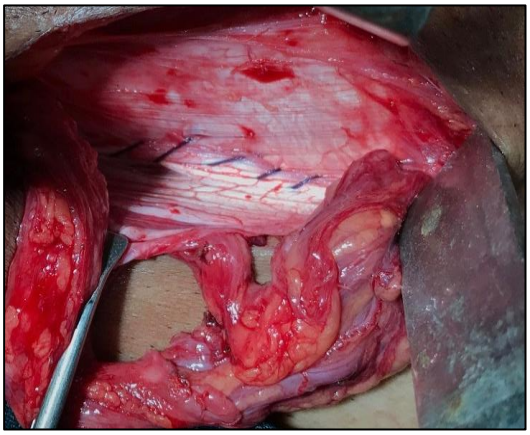

Figure 1: The upper leaf of the EOA is sutured with the inguinal ligament from the pubic tubercle to the internal ring using pds no. 1 absorbable continuous sutures.

Next a splitting parallel incision is made in this sutured upper leaf, partially separating a strip with a width equivalent to the gap between the muscle arch and the inguinal ligament but not more than 2 cms. This splitting incision is extended medially up to the pubic symphysis and laterally 1-2 cms beyond the internal ring.

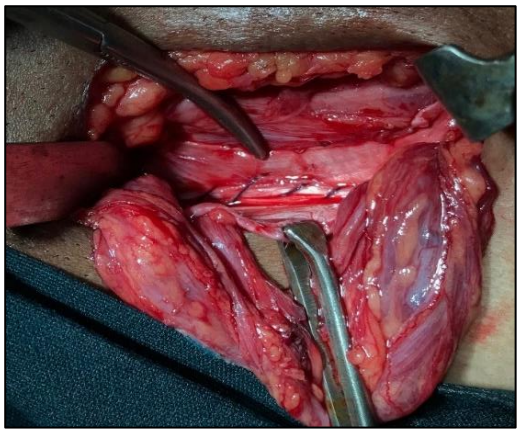

Figure 2: Strip of the external oblique, the lower border of which is already sutured to the inguinal ligament.

A strip of the external oblique, (Figure 2) is now available, the lower border of which is already sutured to the inguinal ligament. The upper free border of the strip is now sutured to the internal oblique or conjoined muscle lying close to it with PDS no. 1 absorbable continuous sutures throughout its length (Figure 3). This

will end in the strip of the EOA being placed behind the cord to make a replacement posterior wall of the canalis inguinalis.

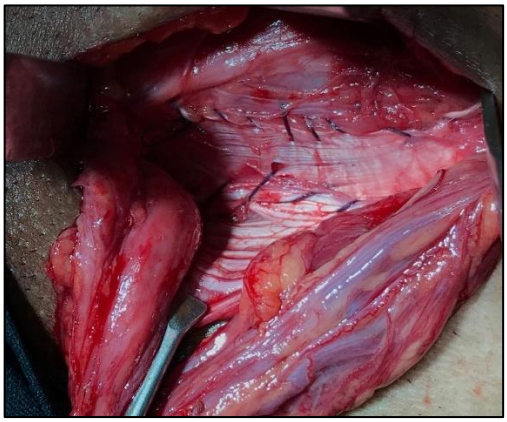

Figure 3: The upper free border of the strip is now sutured to the internal oblique or conjoined muscle lying close to it with PDS no.1 absorbable continuous sutures throughout its length.

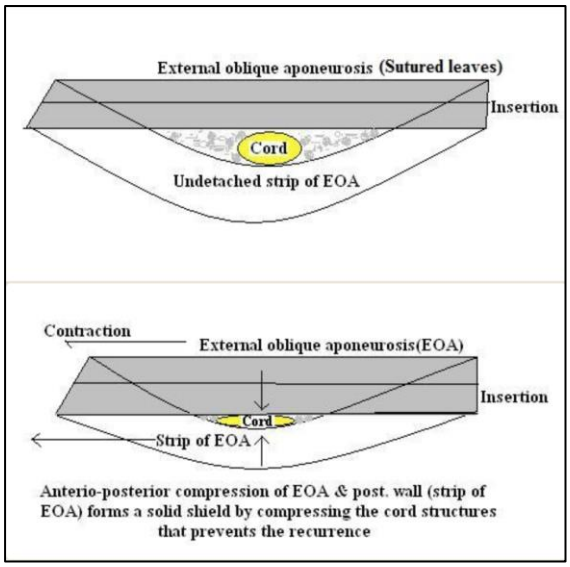

Figure 4: Mechanism of action.

Mechanism of action

The contraction of abdominal muscle wall pulls the strip upwards and laterally against the fixed structures including inguinal ligament and pubic symphysis which creates tension above and laterally and thus turning the strip into as shield to stop any herniation.

Reherniation is stopped by this additional strength provided by the external oblique muscle to the weakened muscle arch to make tension within the strip. The patient can be checked for the shielding action of the strip of EOA by coughing.

Second important factor that forestalls hernia formation within the normal individuals is anterior-posterior compression of the canalis inguinalis caused by the external oblique aponeurosis compressing against the posterior wall. This compression is lost if the posterior wall is weak and flabby thanks to absent aponeurotic extension cover. The strip of EOA sutured in this operation gives the aponeurotic cover to the posterior wall transversalis fascia again and restores this anterior-posterior compression effect during the raised intra-abdominal pressures (Figure 4). The contraction of the external oblique muscle pulls anterior aponeurosis and therefore the posterior placed strip also, naturally compressing the canalis inguinalis.

RESULTS

In a total of 126 patients, 148 inguinal hernias were observed, out of which 118 patients were male and 8 patients were female. Out of the 148 inguinal hernias, 107 cases had indirect hernia, 41 had direct hernia, 22 were bilateral, 3 were obstructed and 1 was strangulated. The mean age of the patients was 38.4 years (range: 18-60 years).

Table 1: Social and clinical characteristics of the study subjects.

	Characteristics	Frequency	Percent
Sex	Male	118	93.7
	Female	8	6.3
Laterality	Unilateral	104	82.5
	Bilateral	22	17.5
Type of anesthesia	Spinal	119	94.4
	General	7	5.6

Table 2: Type of hernia of the study subjects.

Type of hernia	Frequency	Percentage
Direct	107	72.3
Obstructed hernia	3	2
Strangulated hernia	1	0.7

Table 3: Mean and standard deviations of age and clinical characteristics.

Characteristics	Mean	SD
Age in years	38.4	6.36
Mean operating time (unilateral in mins)	62.5	8.48
Mean operating time (Bilateral in mins)	123.09	10.6
Ambulation (in days)	6.42	0.6
Free mobility (in hours)	19.26	2.32
Return to work (in days)	8.62	1.36

A total of 119 patients were operated under spinal and 7 under local. Mean operating time was 62.5 min (45 min to 77 min) for unilateral hernias and for bilateral hernia cases the mean operating time was 123 min (110-140 min).

There were no intra-operative complications. A total of 121 (97.8%) patients were ambulatory within 6-8 h (mean: 6.42 h) and were freely mobile within 18 - 24 h after surgery (mean: 19.26 h). A total of 119 (96.4%) patients returned to work within 6-14 days (mean: 8.62 days). A total of 106 (91.26%) patients were allowed to go home on the same day. The mean hospital stay duration of the patients was 1.11 days. Postoperative pain on movement out of bed was described as mild and tolerable by 109 (92.6%) patients on day 1. The intensity of pain, reduced significantly over the next 2 days to just slight discomfort. No patient had discomfort for quite 15 days after this repair. Two patients had seroma that subsided on its own. One patient had surgical site infection that was treated with antibiotics and drainage of pus. There were no long-term complications, recurrence of the hernias or chronic groin pain.

DISCUSSION

Though many techniques are available for inguinal hernia repair, none of the techniques available till date is free of complications. Every technique has its own advantages and disadvantages. The Lichtenstein technique and its modifications have become a number of the foremost popular and regularly performed surgeries, but complications and recurrence of the hernias still plague this repair technique. There is a high incidence of chronic groin pain following hernia repair, reportedly in the range of 28.76-43.3%.[7] The slightest movement of the mesh from the sutured area is a leading explanation for failure of mesh repair of inguinal hernias.[8]

Chronic groin sepsis after mesh repair requires complete removal of mesh to treat the sepsis.[9] Possible damage to the funiculus and nerve compression following mesh repair thanks to extensive fibrosis also are concerns raised by this system.[10] Laparoscopic hernia repairs increase the value, are technically complex and have a long-learning curve.[11,12] Open no-mesh techniques even have their own limitations.

The Shouldice technique, which is taken into account the gold standard in open no-mesh techniques, has recurrence rates of 1-4% in specialized centers.[13,14] However, the long-learning curve, the risky dissection of the inguinal floor and a scarcity of experience make these figures unattainable for the overall surgeon practicing outside these specialized centers.[15] All open no-mesh repairs are done by using interrupted sutures made from non-absorbable material. Interrupted sutures are used in open repairs to distribute the tension equally on all the sutures to avoid recurrence of the hernia due to splitting of the tissue by the pull of the displaced muscles. Nonabsorbable material is used to keep those structures together for unlimited lengths of time to make them blend properly and gain full strength. The displacement of the internal oblique or transverses abdominis muscle was not reported in the author's technique. Displacement of the strip of EOA is minimal because EOA and internal oblique are adjacent structures. Sutures have no tension during contraction of the muscles because fibers of the EOA strip and internal oblique muscle run parallel to each other in this region of the inguinal canal. This observation led the author to take this trial of repairs with absorbable and continuous sutures. No recurrence seen in this trial for a mean follow-up period of 24. 28 months insufficient to draw conclusions because this is a much longer period than what is required for sutured tissues or for the suture line to blend and gain full strength.

The author postulates that it is the aponeurotic extensions given from the transverses abdominis aponeurotic arch, which make the posterior wall strong and prevent herniations.[16] These aponeurotic extensions are absent or deficient in 53% of the population. Strong musculo-aponeurotic structures around the inguinal canal still give protection to prevent herniation in such individuals.[17] This protection is lost if those muscles are weak.

The strip of EOA in this new technique provides the aponeurotic element to the transversalis fascia of the posterior wall. Contractions of the abdominal muscles pull this strip upward and laterally, creating tension (increased tone) in it and making it a shield to prevent any herniation. The strip provides a new insertion to the weak internal oblique and transverses abdominis muscles. The contractile strength of internal oblique and transverses abdominis is improved by this method. The additional strength given by the external oblique muscle to the weakened muscles of the muscle arch, to create increased tone in the strip and prevent reherniation, is the essence of this operation. The increased tone created in this strip is graded according to the force of muscle contractions. Stronger intra-abdominal blows result in stronger abdominal muscle contractions and stronger muscle contractions result in increased tone in this strip to give graded protection. The strip or the suture line lacks tension at rest. Thus, a strong and physiologically dynamic posterior wall is prepared in this operation. As the steps in this surgery are fixed, there is very little scope for modification by individual surgeons. Hence, this technique will prove to be very effective even in the hand of junior surgeons. The uniformly excellent results seen with this repair technique in centers in other countries all over the world confirm its efficacy.[18]

Cost-saving

Losses of millions of dollars are incurred and millions of working hours are lost every year, affecting the national productivity in treating recurrences or requiring re-exploration for complications in current inguinal hernia operations.

Recurrence

The recurrence rate in long-term follow-ups and outside specialized centers has been reported to be 7-8% (Hospital Episode Statistics data 1995-96).[19-22] This translates into a loss of approximately £5-6 million every year in the UK against 80,000 groin hernia operations (6000 recurrent hernias). Cost of mesh National expenditure on mesh comes to £2-2.5 million every year in the UK, assuming £25-30 as the cost of a standard mesh.

Median time to resume 'normal' activities.[23,24] In the UK, patients are routinely given sick notes for 4-6 weeks. While sick leave does not affect health care spending, it does have an effect on overall public spending. In this authoríse technique of repair, there is no recurrence, or mesh, continuous absorbable suturing saves a packet of suture material and time, and leaves no foreign body inside the patient. No costly equipments are involved and the technique can be easily done on an outpatient basis saving hospital bed. It can routinely be done under local or regional anesthesia and the patients are back to their routine work in 1-2 weeks, thereby reducing sick leave from 4-6 weeks to 1-2 weeks. This makes this repair highly cost-effective. This surgery can be safely delegated to non-consultant staff to reduce the rush to the consultants, and thus reduce losses to the nation due to sick leave taken by the patients on waiting lists. This technique if evaluated and adopted offers significant savings for the patients.

CONCLUSION

The results of this new technique (Desarda repair) for inguinal hernia repair, using continuous absorbable sutures appear promising. This technique does not use any foreign body and has minimal complications with no recurrence of hernia or chronic groin pain. The continuous suturing saves time and one packet of suture material. The dream of every surgeon to give recurrence-free, mesh free inguinal hernia repair may well become a reality in future.

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Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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