ORIGINAL ARTICLE

EVALUATION OF DARN REPAIR FOR RECURRENCE RATE IN THE MANAGEMENT OF INDIRECT INGUINAL HERNIA

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Background: Management of Inguinal Hernia had long been remained an enigma & various method had been employed for its management till date. Recent trend is towards the preferential use of mesh in open as well as Laparoscopic approaches where its advocates almost always undermine the role of raphys in the management of inguinal hernia but Darning repair despite all this critique is still a valid & viable option for the management of Indirect inguinal hernia. **Methods:** This descriptive study was designed & carried out at the surgical units of Ayub Teaching Hospital Abbottabad from February 01, 2016 to October 31, 2018. A total of 117 patients with indirect inguinal hernia (primary) were included in study, managed with Darn Repair & were later followed for 2 years for the evidence of recurrence. **Results:** None of the included patients (followed till last) whom underwent Darning Repair for Indirect Inguinal Hernia were found with the complication of recurrence till 02 years of follow-up although few patients were lost to follow-up for the whole duration 02 years and few others had suffered other early complications like wound infection, seroma, haematoma formation, scrotal swelling or comparatively longer lasting post-operative pain. The Darn Repair was also found cost-effective as compared to Mesh repair. **Conclusion:** Darn Repair despite criticism is a viable & effective option for Indirect Inguinal Hernia Repair (where its role indeed is prophylactic {NOT curative} against the future false recurrence), having no recurrence rate (as per our study results) like mesh repair (as per published literature) besides being reasonably cost-effective.

Keywords: Indirect Inguinal Hernia; Darn repair; Recurrence rate; Ayub Teaching Hospital

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INTRODUCTION

Inguinal Hernia is a commonly seen surgical pathology in General Surgical Units after Appendicitis. It is more common (2/3) on right side as compared to left side (due to late intra-uterine decent of right testicle). Similarly indirect inguinal hernia is twice as more common to direct Inguinal Hernia. Amongst acquired and congenital hernias, inguinal remains to be the most common, with prevalence rate of 25% and 2 % in males and females respectively.[1] Bassini Technique in 1887 was all aimed at determining a repair more reliable one, especially recurrence-wise. Despite technical advancements during last decades, the recurrence rate remains as high as 15%.[2] Lichtenstein in 1986, introduced mesh prosthesis to bridge the Hernial gap but didn't close it with sutures like the Bassini and other procedures. This ostensibly results in a less painful operation and a reduced incidence of suture pulling out effect, which results in lower recurrence rate.[3,4] The recent trend is towards the use of Mesh through open or Laparoscopic approach with its advocates claiming it the most effective from recurrence point of view. Alongside, these advocates of mesh criticize various herniorrhaphy techniques for its higher recurrence rate. Hernioplasty off-course is a procedure with low recurrence rate especially useful for Direct Inguinal Hernias but Darn repair for Indirect inguinal hernias is still a viable option for our patients in general surgery (where its role is purely prophylactic against future false recurrence of direct inguinal hernia). The Darn repair originally described by Moloney et al. is an effective technique for repairing inguinal hernia.[5] Darn is also a cheaper way of repair. The recurrence rate reported from original series was 0.8%.[6]

One of the common objections raised by the recent day critics against raphy is that recurrence does occur but the patients opt to consult for some other surgeon in case of recurrence. This logic indeed is self-contradictory as it indirectly confirms the low recurrence rate of all sort of inguinal hernia including Darn, because we can't witness a significant number of patients with recurrence in our practice (even operated earlier by other surgeons), if compared with the large number of primary hernias being operated every day. So, it can be concluded confidently that recurrence of inguinal hernias is not that huge an issue in our part of the world, especially if the greater number of cases being operated by trainees / residents are also taken into account. Evaluation of recurrence has always been the criteria of a good repair as it is the main thing one sees in follow-up. Although in small group of patients recurrence is attributed to inadequacy of fascial

elements, the vast majority of recurrences result from poor operative technique and failure to identify the sac.[7] A hernia repaired under tension does not heal normally and is subject to disruption throughout the period of wound healing. The maximum incidence of recurrence is seen in first 6 months after surgery, thereafter the incidence falls off to a plateau at 5 years. Lichtenstein has reported recurrence rate of 3.5% and Darning has 3.3% recurrence rate.[8] It is also suggested that recurrence seen after 06 months are due to factors other than technical errors or selection of inferior procedure. Late recurrent is due to decreased synthesis of collagen or increase collagen degradation.

Purpose of conducting this study therefore was to evaluate Darn repair in management of Indirect Inguinal Hernia, compare the results with published literature and then to adapt it to our routine practice if proved equally effective like mesh repair, because of its shorter learning curve and cost-affectivity.

MATERIAL AND METHODS

The study was carried out at the surgical units of Ayub Teaching Hospital Abbottabad from Feb 01, 2016 to October 31, 2018. Male patients aged 20 years and above after being diagnosed with Indirect inguinal hernia by consultants (Senior Registrar & above) and informed consent were included in the study. Female patients, those with direct inguinal hernia, bilateral inguinal hernia, recurrent inguinal hernia, patients unwilling to join study & those with ASA grade 3 and above were excluded of the study. Patients aged less than 40 after admission underwent routine investigations while those over 40 and patients with any risk factors / co-morbidities underwent additional investigation like CXR, ECG & Echocardiography etc. Patients were kept NPO for 8-hour pre-op, operative site shaved with clipper in the morning before OT and a dose of pre-op antibiotic (Inj. Velosef 500 mg IV) was given at the induction of anaesthesia. Most of the patients (106) were operated under spinal anaesthesia while others (11) having some contraindication for Spinal anaesthesia were operated under GA. Per-operatively inguinal skin crease incision was made, subcutaneous tissues were split apart while taking care to coagulate the 2–3 superficial veins, external oblique aponeurosis was incised with a nick & opened by cutting with a scissor medially till lateral crus of superficial inguinal ring & laterally 1–2 cm lateral to the extent of deep inguinal ring (while taking care of underlying ilio-inguinal nerve). Upper and lower flaps were mobilized till conjoint tendon/muscle above and inguinal ligament fibres below respectively. Spermatic Cord was mobilized; indirect hernia sac was identified around deep ring, dissected and ligated at neck following reduction of its contents. Afterwards Darn repair with Polypropylene 1 started from the fascia over pubic tubercle, proceeded with laterally (with locking / figure of 8 like sutures) till 1–2 cm lateral to the deep ring where it was double-locked with Aberdeen knot and then continued-back medially in the same fashion till pubic tubercle & was locked there again with Aberdeen knot. It produced a well dense mesh / web like structure to reinforce the posterior wall's potential weakness against future false recurrence of direct inguinal hernia. Haemostasis was secured, external oblique aponeurosis was closed with catgut while subcutaneous tissues / skin with silk 2/0 interrupted (vertical mattress) or Polypropylene 2/0 sub-cuticular sutures. Wound was dressed, patient shifted to ward and kept on IV antibiotics (Inj. Cephradine 500 mg at 08 and 16 hours, two doses only), intravenous analgesia (Inj. Nalbuphine / Tramadol in Dextrose / Normal Saline infusion 500 cc BD (very slow) for initial 24 hours and Inj. Diclofenac I/M SOS for initial 24–48 hours) along with regular oral analgesics like Diclofenac & Paracetamol with Orphenadrine Citrate combination (24 post-operative hour onward). Patients usually were discharged on the 2nd post-op day (during consultant morning rounds). Pain intensity was assessed by the number of SOS injections other than IV analgesia infusion BD. Patients with persistent pain (not responding well to above mentioned analgesia) were kept admitted a little longer and were additionally provided some alternative analgesics like Injection Ketorolac (diluted) IV BD for next 24–48 hours. Similarly, patients with seroma / haematoma formation, scrotal oedema were kept a little longer and then discharge with reassurance and advice for follow-up visits at OPD while those with wound infection were re-admitted for wound exploration (if needed) or conservative management of the surgical site infection.

Patients were followed for wound infection on 5th post-op day and early recurrence at 1, 3, 6, 12, 18 & 24 months' time post-operatively. Patients were advised to consult at any time if some bulge (recurrence) or untoward pain was felt at operation site even prior to the scheduled visits time.

RESULTS

A total of 117 male patients with primary Indirect Inguinal hernia were initially included in study. Age range was 20 to 72 years. Mean age was 38.4 years while median age was 36 years. Patients belonged to random professions like students, labourers, teachers, lawyers & elderly people etc. Presenting complaint in most of the patients 63 (53.84%) was inguinal lump appearance, pain / dragging sensation in 29 (24.78%) patients while both lump appearance with pain / dragging sensation was found in 25 (21.36%) patients. Hernia was right sided in 93 (79.48%) & left sided in 24 (20.51%) patients. Duration of symptoms varied from 02 months to 06 years. Type of hernia was

Bubonocele in 101 (86.32%) patients, funicular in 12 (10.25%) patients while inguino-scrotal in 4 (3.41%) patients. All the hernias off-course were reducible with positive ring occlusion test on examination, being a criterion for a patient's inclusion in the study.

Mean operative time was 43.6 minutes while mean hospital stay was 2.6 days. Eight (6.83%) patients with post-operative pain out of proportion to other patients were kept in hospital for additional 24–48 hours, i.e., till settlement / reduction of pain. Seven (5.98%) patients presented on 5–7 post-op day with wound infection were readmitted and managed for wound infection with daily wound wash (normal saline & pyodine) or wound exploration & wound packing with gauze. Similarly, 4 (3.41%) patients who developed seroma, & 2 (1.70%) patients who developed haematoma in their wounds were either reassured or their seroma / haematoma was drained percutaneously. Similarly, 3 (2.56%) patients who developed scrotal oedema were reassured and called to OPD for follow-up on weekly basis till its settlement.

Besides these patients with seroma, haematoma & pain factor, rest of the patients while being discharged on 2nd post-op day were examined for their latest wound status, wound dressing was changed and they were advised to continue with their dressing on daily basis till 13th post-op day while suture removal was proposed to be carried out on 10th post-op day.

Patients were followed for recurrence at 1, 3, 6, 12, 18 and 24 monthly intervals. During this study we had successfully been able to follow 115 (98.29%) patients for 3 months & no recurrence was noticed. One hundred and nine (93.16%) patients were followed till 12 months & again no hernia recurrence was there. One hundred and six (90.59%) patients were followed & witnessed till 24 months without any hernia recurrence. Thus 11 patients were lost to follow-up at various stages of study while 106 patients could be followed till last (2 years) and were thus finally considered towards final analysis / interpretation of the study results.

DISCUSSION

Repair of Inguinal Hernia is one of the most common surgical procedures (10–15%) performed all over the world. Since the Bassini's repair in 1887, numerous operative techniques have been reported, but yet no definitive operative technique is considered to be the best.[9] The various techniques of inguinal hernia surgery can be broadly classified into tissue-based and prosthetic methods. Tissue-based repairs have major drawback; the increased amount of tissue tension of most of them is a leading factor incriminated in recurrence.[10]

As against other type of tissue repair (i.e., Bassini, Modified Bassini, Lytle or Shouldice), Darning repair has the advantage to be a tension free procedure, where a weave is constructed between the roof and floor of inguinal canal to strengthen its posterior wall. This method of repair is common in the UK and some other English-speaking countries where most studies on this technique have been conducted.[11] Besides, Darning technique as against other tissue-based techniques has been claimed to have a short learning curve, particularly when compared with other popular tissue-based methods of repair such as Shouldice technique. The procedure therefore, can be learned by surgeons who perform hernia surgery in many health care facilities as well as those in private settings, many of whom continue to practice only the Bassini method.[12]

Age range of patients in our study was 20–72 years, which is comparable with the study conducted by Khyrallh[13] with age range of 20–60 years, Das *et al*[14] with age range of 19–46 years, Memon *et al*[15] whom recorded age range of 22–58 years for Group A (Hernioplasty) and 20–60 years for Group B (Darn repair) patients & Khan *et al*[16] with age range of 15–50 years. Mean age observed in our study was 38.4 years which is comparable with the study conducted by Khyrallh[13] with mean age of 48.6 years for group A (Mesh) & 52.4 years for group B (Darn) patients & Khan *et al*[16] with a mean age of 36 years for Group A (Darn) patients and 34 years for Group B (Mesh) patients. Patients in our study belonged to random professions like the study conducted by Khan *et al*[16] where most of the patients (74%) were manual workers. Hernia was right sided in 93 cases (79.48%) & left sided in 24 (20.51%) patients in our study which is comparable with the studies by Khyrallh[13] where right sided herniae were 27 (54%) & 24 (48%) in Group A & B respectively while left sided herniae were 23 (46%) & 26 (52%) in group A & B respectively. Similarly in the study by Al-Saiegh *et al*[17] right sided hernia were 61 (58.65%) and left sided were 43 (41.31%). We included only indirect inguinal hernia cases in this study which may be compared to the study of Khyrallh[13] whom recorded indirect herniae in 38 (76%) cases of Group A and 41 (82%) cases of Group B patients, & Al-Saiegh *et al*[17] whom recorded it indirect in 79 (75.96%) and Khan *et al*[16] where indirect herniae ware 43 (68.26%) in group A and 50 (79.36%) in Group B.

Mean operative time was 43.6 minutes in our study while the same was 41.6±4.2 for Group A, 36.8±5.4 minutes for Group B patients in study conducted by Khyrallh[13] & 44.7±0.89 & 50.9±0.56 minutes in study by Al-Saiegh *et al*[17] for Group A & B respectively. Mean hospital stay in our study was 2.6 days which is comparable to the study by Khyrallh[13] with a mean hospital stay of 1.3±0.63 days for Group A and 1.6±0.82 days for Group B patients, to the study by Khan *et al*[16] with a mean hospital stay of 1.05 days for Darn & 1.57 days for Mesh patients & Al-Saiegh *et al*[17]

where it was 37.18±1.97 hours and 47.17±1.79 hours for group A and B respectively.

Early wound complications recorded in our study were 4 seroma, 2 haematoma, 3 scrotal oedema & 7 wound infection cases, the same were 7 patients in group A and 6 patients in group B of study by Khyrallh[11,13], in study by Al-Saiegh *et al*[17] scrotal edema were 15 patients while 5 were haematoma and 5 were wound infection patients. Zeybek *et al*[18] found 4.4% haematoma and 1.7% wound infections in their study; however, literature is crowded with studies where each of them had different rates of haematoma & infections.[19] Time taken to return to daily activities was 2–4 days while time taken to return to work was 10–15 days which is comparable with the study of Khyrallh[13] where return to work was 10.8±7.4 days for group A and 9.8±5.6 days for Group B patients. Recurrence rate in our study was zero which is comparable to the study conducted by Khyrallh[13] where it was 4% for darn and 2% for mesh repair, the same was zero % by Al-Saiegh *et al*[17] and zero % by Khan *et al*[16] in their study for both groups of Darn & Mesh repair.

CONCLUSION

Excellent results of Darn repair in the management of indirect inguinal hernia (with zero recurrence rate) were observed in our study. Darn repair in indirect inguinal hernia is in-fact done to prevent the future recurrence of direct inguinal hernia which is never an issue at that particular time of surgery. Its role therefore is preventive rather than curative in such cases and gets ample time to reinforce the posterior inguinal wall by inducing body reaction (fibrosis) to foreign body (Polypropylene thread). Darn repair is thus a valid, viable & reliable option to practice comfortably in the management of Indirect Inguinal Hernia with no / low recurrence rate & cost-effectiveness.

AUTHORS' CONTRIBUTION

HK: Study Conceptualization, Data Collection, Write-up. MAK: Data analysis, Data Interpretation. MKR: Data Collection, Data analysis, Proof reading. AGSK: Literature search, Data Interpretation, write-up. AW: Literature search. RA: Literature search

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