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A Comparative Study between Desarda and Mesh Hernioplasty (Lichtenstein) in Inguinal Hernia: A multi-centre Experience

Md. Shahidul Islam[1*], Dr. Mitheel-Ibna Islam[2], Md. Tarikul Islam[3], Dr. Anirudha Sardar[4]

[1]Assistant Professor, Department of Surgery, Khulna Medical College, Khulna, Bangladesh.
[2]Resident Surgeon, Department of Gynnae&Obs, Khulna Medical College Hospital, Khulna, Bangladesh.
[3]Associate Professor & HOD, Department of Burn &Plastic Surgery, Khulna Medical College Hospital, Khulna, Bangladesh,
[4]Resident Surgeon, Department of Surgery, Khulna Medical College Hospital, Khulna, Bangladesh.

ABSTRACT

Introduction: Inguinal hernia is a common problem and its repair is one of the most commonly performed procedures in general surgical practice. Several methods have been developed including Lichtenstein's repair. Among these Lichtenstein's repair has been the standard technique for the last few decades. In recent times a new procedure "no mesh Desarda hernia repair" has emerged as a recognized operative method for inguinal hernia repair.

Aim of the study: The aim of the study was to find out the efficacy and safety profile between Desarda and Mesh Hernioplasty (Lichtenstein) in Inguinal Hermia.

Methods: A comparative study between the 50 patients undergoing open mesh and Desarda repair was done based on randomization. All patients were diagnosed with an inguinal hernia from January 2019 to December 2020 at Khulna Medical College and Hospital, Khulna, Bangladesh and some private hospital, Khulna, Bangladesh.

Result: During follow up, 5 (20.00%) patients suffered from chronic pain in lictenstein group compared to 3(12.00%) patients in desarda, Recurrence was 4(20.00%) seen in lictenstein group compared to 1 (4.00%) patients in desarda. Seroma was seen in 1 patients in desarda and nil in L group whereas hematoma was seen more in L group.

Conclusion: The results of the study showed that the effectiveness of the Desarda technique with respect to influencing the early clinical outcomes of hernia repair is similar to that of the Lichtenstein method. However, the operator in this study showed that the Desarda repair requires significantly shorter operative time, is painless, and less Hospital stays with cost-effectiveness.

Keywords: *Comparative Study, Desarda, Mesh Hernioplasty,Lichtenstein, Inguinal Hermia*

***Corresponding Author**
Md. Shahidul Islam
Assistant Professor, Department of Surgery, Khulna Medical College, Khulna, Bangladesh

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INTRODUCTION

The hernia is a Latin word that means rupture of a portion of a structure [1]. It is an abnormal protrusion of a viscus through the weak wall of the cavity (abdomen) containing it. Weakness of the abdominal wall is either congenital or acquired in origin. Hernia can be reducible/irreducible/obstructed or strangulated. The external abdominal hernia is the commonest form of spontaneous hernia, and these are inguinal, femoral and umbilical in percentages 73 %, 17%,and 8.5% respectively. As high as 80 to 90% of the repairs are carried out on males, and the most frequent type is a right indirect inguinal hernia [2]. Inguinal hernias is a very common surgical problem throughout the world in all races of population. It is estimated that 7% of the population will develop an inguinal hernia worldwide. As there is a risk of obstruction or strangulation, an inguinal hernia should always be repaired unless there are specific contraindications [3, 4]. The inguinal hernia may be indirect if passing through the deep inguinal ring or direct, resulting from weakness in the transversal fascia in the posterior wall of the inguinal canal. The factors leading to the development of a hernia can be divided into congenital and acquired defects. The former may be responsible for the majority of groin hernia. The surgical treatment of inguinal hernia can be carried out by various techniques e.g. Bassini repair, Darning, Shouldice repair, Lichtenstein repair and Laparoscopic hernia repair. Inguinal hernia repair is one of the most commonly performed operations worldwide [6]. Between 600,000 and 800,000 hernias are repaired annually in the United States, making hernia repair one of the most

common operations performed by general surgeons [5]. Many surgical techniques or methods have been developed in the past. In 1880, Bassini published his original description of inguinal hernia repair. Since then many modern modifications such as the Shouldice repair, Lichtenstein's tension- free mesh repair and the recent innovation of laparoscopic mesh repair of inguinal hernia have originated from it.[3] But Lichtenstein's repair has been the standard technique in inguinal hernia. But mesh repair has its limitations. It is unphysiological as the mesh is used. Chronic inguinal pain, seroma formation, foreign body sensation, and risk of mesh infection are common complications and not recommended in strangulated hernias and extra cost involved by the mesh itself [7]. In recent times a new procedure has been described by Dr. Mohan Desarda, from Poona hospital and research centre, India. It involves the use of an undetached strip of external oblique aponeurosis to strengthen the posterior wall of the inguinal canal which is based on physiological principles. Several randomized controlled trials and systemic reviews compared Lichtenstein's tension-free mesh repair and no mesh Desarda repair and showed that the Desarda method has some distinct benefits. This is a physiological repair and is tension free, and can be used in the strangulated hernia [7, 8]. Recurrence and complication rates are equal to or less than Lichtenstein's repair [7]. It's a simple procedure with equal or less operating time than Lichtenstein's repair, early ambulation and less time of hospital stay, low cost for the patient as the mesh is not used and most importantly no question of mesh-related complications such as mesh rejection, infection, migration and foreign body sensation and chronic groin pain which is comparatively low in this procedure [7, 8]. The aim of the study was to find out the efficacy and safety profile between Desarda and Mesh Hernioplasty (Lichtenstein) in Inguinal Hermia.

METHODOLOGY & MATERIALS

A comparative study between the 50 patients undergoing open mesh and Desarda repair was done based on randomization. All patients were diagnosed with an inguinal hernia from January 2019 to December 2020 at Khulna Medical College and Hospital, Khulna, Bangladesh and some private hospital, Khulna, Bangladesh. Just before taking the patient for surgery, a sealed envelope (written mesh/ desarda) was opened and thus randomized. Randomized patients were followed for one-year duration postoperatively and outcomes were compared. All the information was taken in a preform, designed for the study. Ethical clearance was taken from the ethical committee before conducting the study.

Inclusion criteria:

- Primary inguinal hernia (Both direct and indirect types)
- Male adults
- Signed informed consent
- Good condition of external obliqueaponeurosis (assessed during surgery)

Exclusion criteria:

- Age <18 years
- Recurrent hernia
- Incarcerated hernia
- Strangulated hernia
- Infection at the groin site
- No consent

Operation technique: Inguinal Incision is taken and deepened in layers to expose external oblique aponeurosis [EOA]. As far as possible, a thin, filmy fascial layer covering EOA is kept intact. EOA is cut in line with the upper crux of the superficial ring. The sac is excised and transfixed in indirect hernias and is inverted indirect hernias. The upper leaf of EOA is sutured within a curved inguinal ligament from the pubic tubercle to the internal abdominal ring using 2-0 Monofilament polydioxanone violet in a continuous interlocking fashion as shown in the Fig-1. The splitting incision is made in this sutured upper leaf, partially separating a strip 2 cm wide. This incision is extended medially up to pubic symphysis and 1-2cm beyond the internal abdominal ring laterally. The medial insertion and lateral continuation of this strip are kept intact as shown in Fig-2. The upper free border of this strip is now sutured to the internal oblique with Monofilament polydioxanone violet continuous interlocking fashion all along its length as shown in Fig-3. This will result in the strip of the EOA being placed behind the cord to form a new posterior wall of the inguinal canal. Now the spermatic cord is placed in the inguinal canal and the lower leaf of EOA is sutured to the newly formed upper leaf of EOA in front of the cord with absorbable continuous interlocking sutures Fig-4.

Undermining of the newly formed upper leaf on both its surfaces and excision of bulky cremasteric muscle if required facilitates its approximation to the lower leaf. This is followed by routine closure of superficial fascia and the skin.

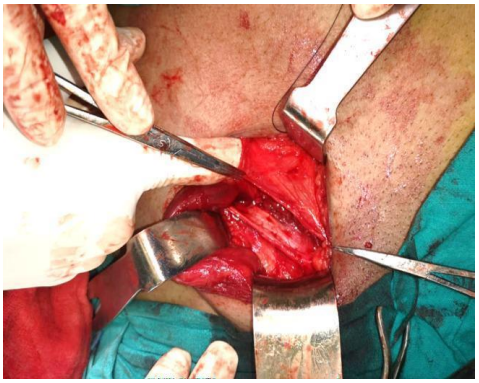

Figure-1: Upper lip of EOA sutured to the inguinal ligament

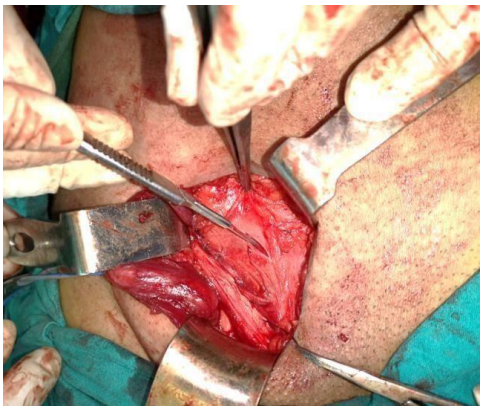

Figure-2: Splitting incision over EOA

Figure-3: Sutured upper free border of the strip to the conjoint tendon

Figure-4: Sutured lower leaf of EOA to newly formed upper leaf of EOA

All data were presented in a suitable table or graph according to their affinity. A description of each table and graph was given to understand them clearly. All statistical analysis was performed using the statistical package for social science (SPSS) program, and Windows. Continuous parameters were expressed as mean±SD and categorical parameters as frequency and percentage. Comparisons between groups (continuous parameters) were made by Student's t-test. Categorical parameters compared by Chi-Square test. The significance of the results as determined by a 95.0% confidence interval and a value of $P<0.05$ was considered to be statistically significant.

RESULT

Age distribution in table 1 suggests that mean of age in study population was 33.24 (P value here [0.412] was representative of statistically non-significant result in regards to the age different in both groups). Clinical profile of the study population depicts that there was no major difference in the incidence of unilateral, bilateral or side distribution among the patients of both groups. In case of Desarda's repair, result was excellent. Seroma formation was observed in approximately 04% (01 out of 25) patients. In case of Lichtenstein repair, the overall result was also good. However, the incidence of hematoma formation and orchitis was relatively higher. Postoperative pain was assessed here by using the pain score and VAS (visual analogue scale) which suggest that pain profile was considerable better in case of Desarda's repair in contrast to the Lichtenstein repair. After Desarda's repair, approximately 92% (23) patients were discharged within 3rd postoperative days. P value (0.318) is indicative of statistically insignificant result here. At least 06 months follow up was done for each patient in this clinical research, which is indicative of that this variable was relatively better in case of Desarda's repair. P value (0.262) was insignificant here. Table 8 was representative of that recurrence rate was slightly higher in case Lichtenstein repair in comparison to Desarda's repair.

Table-1: Age distribution in both the groups.

Groups	Frequency	Percentage	Mean Age
Desarda	25	50.00	33.24
Lichtenstein	25	50.00	33.56
Total	50	100.00	33.4

Table-2: Side distribution as per groups.

Groups	Side						Total
	Bilateral		Left		Right		
	N	%	N	%	N	%	
Desarda	5	20.00	10	40.00	10	40.00	25
Lichtenstein	5	20.00	9	36.00	11	44.00	25

Table-3: Seroma, Hematoma & Orchitis formation in both the groups.

Groups	Seroma		Hematoma		Orchitis	
	No	Yes	No	Yes	No	Yes
Desarda	24	1	25	0	25	0
Lichtenstein	25	0	23	2	24	1
P-value	0.495		0.242		1.00	

Table-4: Early and late postoperative pain profile.

Groups	Early Post-Op Pain(<3 Days)		Late Post-Op Pain (>3 Days)		Total
	No	Yes	No	Yes	
Desarda	24	1	24	1	25
Lichtenstein	20	5	17	8	25
P-value	0.004		0.00		50

Table-5: Distribution as Per Hospital Stay.

Groups	Hospital stay				P-value
	<3 days		>3 days		
	N	%	N	%	
Desarda	23	92.00	2	8.00	0.318
Lichtenstein	21	84.00	4	16.00	

Table-6: Distribution as Per Chronic Pain.

Groups	Chronic Pain				P-value
	No		Yes		
	N	%	N	%	
Desarda	22	88.00	3	12.00	0.262
Lichtenstein	20	80.00	5	20.00	

Table-7: Distribution as Per Recurrence.

Groups	Recurrence				P-value
	No		Yes		
	N	%	N	%	
Desarda	24	96.00	1	4.00	1.00
Lichtenstein	20	80.00	4	20.00	

DISCUSSION

In this 2 year's study, we encountered a significant difference comparing early and late postoperative pain in both the groups whereas there was no other significant difference comparing other factors. Currently, the results of hernia treatment, even as per the EHS guidelines, vary from moderate to excellent. The mean recurrence rate for the standard Lichtenstein procedure is 1% in hernia-specialized centres but is higher in community hospitals (about 4%), and the reported rate is even 18% in some studies [9]. The data published for other mesh techniques vary: 0 to 4.2% recurrences for Prolene Hernia System (PHS), 0 to 4% for Rutkow, 1.6 to 19.0% for the (TAPP) [9-11]. When active postoperative monitoring is done, the frequency can reach up to 50% [9]. The most frequently reported complications were seroma, hematoma, chronic pain, surgical-site infection, and recurrence [12]. Death and major worsening of operated patients' quality of life were rare but were reported too [12, 13]. These data suggest the need for further investigation of the clinical problems. Globally many studies are ongoing to improve the technique of inguinal hernia repair. Commercially available lightweight prolene meshes, composed meshes, and other biologic prostheses are being tested. The scientific work of optimizing hernia surgery as well as reducing the number of complications is stillin progress. Also, tissue-based techniques are not out of the realm of consideration in the hernia field. This Desarda technique for inguinal hernia repair is a novel tissue-based method. Despitethe objections that emerged by some authors, the application of the external oblique aponeurosis in form of an undetached strip (which makes a posterior wall of the inguinal canal stronger) is being established as a new concept in tissue-based hernia repair [14, 15]. The technique is original, different, and new from historical methods using the external oblique aponeurosis, proposed by McArthur and Andrews or Zimmermann [16, 17]. This novel repair method completes the principles of ''no tension'' presented by Lichtenstein. The aponeurotic strip is displaced from the anterior to the posterior wall of the inguinal canal without additional tension at the posterior wall. The concept of the undetached, mobile aponeurotic strip that ''physiologically'' strengthens the posterior wall of th e inguinal canalis original and exciting [18, 19]. When considering Desarda as ''dynamic enforcement'' of the inguinal canal's posterior wall, the Lichtenstein can be known as ''prosthetic enforcement.'' The author of the first method hypothesizes that a naturally displaced and mobile aponeurotic strip is far more ''physiological'' than scar tissue produced around a synthetic prosthesis for creating a mechanism against re herniation. The Shouldice technique, which is still accepted worldwide, is tissue-based as well. To date, there is no such comparison study on aponeurotic tissue and the transversal fascia. The properties of inguinal connective tissue are being generalised mainly from studies on transversalis fascia. It should be known that genetic, as well as biochemical changes, are found in only 20 to 30% of patients. Assuming that there are about 15 to 20% recurrences after some tissue-based techniques, 80% of patients survive without recurrence. It might be postulated that there is a populationof hernia patients in whom tissue-based techniques could be used safely. In our study, there was no statistically significant difference encountered comparing complications in both the groups such as seroma, hematoma, orchitis etc. The recurrence rate in both the groups was equal ie one in each group. In the Desarda group,the recurrence was obviously due to technical error. The aponeurotic strip created was big in length, resulting in a newly formed big deep inguinal ring and hence re- herniation. In the Lichtenstein group, the recurrence was typical. This additionally supports the idea that surgical technique is crucial for a good final result. Although chronic pain is defined as lasting more than 3 months by the International Association for the Study of Pain, in our study we defined chronic pain as pain lasting for more than 6 months due to the use of prolene mesh for hernia repair and taking into account the fact that inflammatory response to foreign material may last longer [15]. This approach has been used by many other authors and is recommended in the latest publications [21-23].In our study, 5 patients from the desarda group experienced chronic pain while 10 patients from the Lichtenstein group experienced the same, probably due to nerve entrapment following mesh hernioplasty. This difference was not statistically significant too Whereas comparing the parameters of early and late postoperative pain which was considered as less than 3 days post-operativeand more than 3 days post-operative respectively, in the desarda group, only one patient experienced early postoperative pain as compared to 11 from the Lichtenstein group which is statistically significant. Late postoperative pain, in the desarda group, was experienced by only 2 patients whereas, in the Lichtenstein group, 16 patients experienced statistically significant pain. The pain was monitored with help of a visual analogue scale in both groups. In comparison with a hospital stay, there was no statistically

significant result noted. The higher ratio of hematoma and seroma after the use of the Lichtenstein method can be explained by the influence of the prolene mesh on surrounding tissues. This is consistent with other studies and the known side effect of polypropylene on tissue [24, 25]. Foreign body sensation and abdominal wall stiffness were expressed equally by both the groups and the results are within the range (4.5–43.8%) reported by other authors for mesh techniques [26, 27]. Surprisingly, the mesh- related sensations were experienced similarly by patients from both groups and did not change even after the participants were informed of the technique used after 2years of follow-up. Mitura and Roman-czuk have published the results of a 6-month follow-up study of the Desarda and Lichtenstein approaches. They observed no recurrence, and pain after 6 months was comparable in the two groups (VAS scores were 8 vs. 11 in the Desarda and Lichtenstein groups, respectively; p=0.691). Situma *et al.*, presented their results of Desarda versus modified Bassini inguinal hernia repair, concluding that there was no difference between these techniques regarding pain and return to normal activity [18]. Other results, published by Desarda and his group, were based on a comparison of his technique and the Lichtenstein technique [19]. There was no recurrence in Desarda group patients and 1.97% recurrence in mesh group patients; 6.49% of patients operated in the mesh group and zero patients in the Desarda group complained of chronicpain 1 year after surgery. In literature, despite some methodologic inadequacies in presented articles, the Desarda method merits more attention and more efficacy compared to the Lichtenstein group. Paradoxically, in the modern world, the cost of surgery becomes the real issue. The cost of inguinal hernia treatment, is not insignificant, however, especially in developing countries in Africa and Asia. One advantage of the Desarda technique is its very low cost. That is why many authors published articles recently demonstrated an interest in this technique [28, 29-32]. The cost of the Desarda operation is low because a synthetic prosthesis is not used. The price of composite mesh can be a bigtask in developing countries. Not only the economic issues but the use of synthetic material is still controversial in young patients. The effect of polypropylene placement inside a human organism for a lifetime is still unknown. Also,data are appearing about sexual impairment after mesh implantation; hence many surgeons try to avoid mesh prostheses for hernia treatment in young patients. Also, Desarda is a tissue-based technique, which can be used in a contaminated operative field, usually seen for strangulated hernias.

Limitations of the study:

The study was conducted in a single hospital with small sample size. So, the results may not represent the whole community.

CONCLUSION AND RECOMMENDATIONS

Desarda repair is easy to perform and has shown to take shorter operative time. Also, there is no need of mesh with less suture material requirement. So, this method proves cost effective than the Lichtenstein method. Desarda hernia repair was found to be superior to Lichtenstein repair in terms of post-operative pain and foreign body sensation. It can be recommended for younger patients. This study has shown that the efficacy of Desarda repair in respect to influencing long term outcomes in patients is comparable to Lichtenstein repair. So, it can be safely used as an alternative to conventional method. In infected and strangulated cases, Desarda repair can be used effectively, as riskof mesh infection is eliminated. Also, this technique can eliminate the fear of mesh infection in diabetic patients.

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REFERENCES

1. MacFadyen Jr, B. V., & Mathis, C. R. (1994, June). Inguinal herniorrhaphy: complications and recurrences. In Seminars in Laparoscopic Surgery (Vol. 1, No. 2, pp. 128-140). Sage CA: Thousand Oaks, CA: Sage Publications.
2. Najamulhaq, R., Chaudhry, I. A., Khan, B. A., & Afzal, M. (2006). Groin sepsis following Lichtenstein inguinal hernioplasty without antibiotics prophylaxis: a review of 100 cases. Pak J Med Sci, 22(4), 416-9.
3. Kingsnorth, A. N., Giorgobiani, G., & Bennett, D. H. (2008). Hernias, umbilicus, abdominal wall. Bailey and love's short practice of surgery. 25th ed. London: Hodder Arnold, 968-90.
4. Baskerville, P. A., & Jarrett, P. E. (1983). Day case inguinal hernia repair under local anaesthetic. Annals of the Royal College of Surgeons of England, 65(4), 224.
5. Courtney M, Townsend JR, Beauchamp RD, Evers BM, Mattox KL (2007). Sabiston Textbook of Surgery: The Biological Basis of Modern Surgical Practice. 17th ed: Elsevier Inc.
6. Margaret, F., & Brebdan, M. (2005). Surgery of the groin and external genitalia. Farquharron's text book of operative general surgery,.
7. Szopinski, J., Dabrowiecki, S., Pierscinski, S., Jackowski, M., Jaworski, M., & Szuflet, Z. (2012). Desarda versus Lichtenstein technique for primary inguinal hernia treatment: 3-year results of a randomized clinical trial. World journal of surgery, 36, 984-992.
8. Desarda, M. P., & Ghosh, A. (2006). Comparative study of ppen mesh repair and Desarda's no-mesh repair in a District Hospital in India. East and Central African Journal of Surgery, 11(2), 28-34.
9. Eklund, A., Rudberg, C., Smedberg, S., Enander, L. K., Leijonmarck, C. E., Österberg, J., & Montgomery, A. (2006). Short-term results of a randomized clinical trial comparing Lichtenstein open repair with totally

extraperitoneal laparoscopic inguinal hernia repair. Journal of British Surgery, 93(9), 1060-1068.
10. Lichtenstein, I. L., Shulman, A. G., Amid, P. K., & Montllor, M. M. (1989). The tension-free hernioplasty. The American Journal of Surgery, 157(2), 188-193.
11. Hasegawa, S., Yoshikawa, T., Yamamoto, Y., Ishiwa, N., Morinaga, S., Noguchi, Y & Rino,Y. (2006). Long-term outcome after hernia repair with the prolene hernia system. Surgery today, 36(12), 1058-1062.
12. Schmedt, C. G., Sauerland, S., & Bittner, R. (2005). Comparison of endoscopic procedures vs Lichtenstein and other open mesh techniques for inguinal hernia repair: a meta-analysis of randomized controlled trials. Surgical Endoscopy and Other Interventional Techniques, 19(2), 188- 199.
13. Robinson, T. N., Clarke, J. H., Schoen, J., & Walsh, M. D. (2005). Major mesh-related complications following hernia repair. Surgical Endoscopy and Other Interventional Techniques, 19(12), 1556-1560
14. Bay- Nielsen, M., & Kehlet, H. (2008). Anaesthesia and post- operative morbidity after elective groin hernia repair: anation- wide study. Acta Anaesthesiologica Scandinavica, 52(2), 169- 174.
15. E. Losanoff, Bruce W. Richman, James W. Jones (2001). Inguinal herniorrhaphy with an undetached strip of external oblique aponeurosis: old or new?The European journal of surgery, 167(11), 877-877
16. Losanoff, J. E., & Millis, J. M. (2006). Aponeurosis instead of prosthetic mesh for inguinal hernia repair: neither physiological nor new. Hernia, 10(2), 198-199.
17. McArthur, L. L. (1901). Autoplastic Suture in Hernia, And Other Diastases.—Preliminary Report. Journal of the American Medical Association, 37(18), 1162-1165.
18. Ravitch, M. M., & Hitzrot, J. M. (1960). The operations for inguinal hernia: I. Bassini, Halsted, Andrews, Ferguson. Surgery, 48(2), 439-442.
19. Desarda, M. P. (2006). Physiological repair of inguinal hernia: a new technique (study of 860 patients). Hernia, 10(2), 143-146.
20. Desarda, M. P. (2003). Surgical physiology of inguinal hernia repair-a study of 200 cases. BMC surgery, 3(1), 2.
21. Carroll, I., & Curtin, C. M. (2013). Management of chronic pain following nerve injuries/CRPS type II. Hand clinics, 29(3), 401-408.
22. Page, B., Paterson, C., Young, D., & O'Dwyer, P.J. (2002). Pain from primary inguinal hernia and the effect of repair on pain. British journal of surgery, 89(10), 1315-1318.
23. Aasvang, E., & Kehlet, H. (2004). Chronic postoperative pain: the case of inguinal herniorrhaphy. British journal of anaesthesia, 95(1), 69-76.
24. Alfieri, S., Amid, P. K., Campanelli, G., Izard, G., Kehlet, H., Wijsmuller, A. R., & Doglietto, G.B. (2011). International guidelines for prevention and management of post-operative chronic pain following inguinal hernia surgery.
25. Grant, A. (2002). Open mesh versus non-mesh repair of groin hernia meta-analysis of randomized trials leased on individual patient data. Hernia, 6(3), 130-136.
26. Horstmann, R., Hellwig, M., Classen, C., Röttgermann, S., & Palmes, D. (2006). Impact of polypropylene amount on functional outcome and quality of life after inguinal hernia repair by the TAPP procedure using pure, mixed, and titanium- coated meshes. World journal of surgery, 30(9), 1742-1749.
27. Paajanen, H. (2007). A single-surgeon randomized trial comparing three composite meshes on chronic pain after Lichtenstein hernia repair in local anesthesia. Hernia, 11(4), 335-339.
28. Staerkle, R. F., Buchli, C., & Villiger, P. (2009). Patient satisfaction, hernia recurrence rate, and chronic pain 10 years after endoscopic total extraperitoneal inguinal hernia repair. Surgical Laparoscopy Endoscopy & Percutaneous Techniques, 19(5), 405-409.
29. Situma, S. M., Kaggwa, S., Masiira, N. M., & Mutumba, S. K. (2009). Comparison of Desarda versus modified Bassini inguinal Hernia repair: a randomized controlled trial. East and Central African Journal of Surgery, 14(2), 70-76.
30. Desarda, M. P., & Ghosh, A. (2006). Comparative study of ppen mesh repair and Desarda's no-mesh repair in a District Hospital in India. East and Central African Journal of Surgery, 11(2), 28-34.
31. Desarda, M. P. (2007). A new technique of inguinal hernia repair—neither similar to nor modification of Desarda's repair. J Indian Med Assoc, 105(11), 654.
32. Desarda, M. P. (2008). No-mesh inguinal hernia repair with continuous absorbable sutures: A dream or reality? (a study of 229 patients). Saudi journal of gastroenterology: official journal of the Saudi Gastroenterology Association, 14(3), 122.