Open Tension Free Repair Of Inguinal Hernias. The Lichtenstein Technique. Advantages And Limits In An African Context: A Retrospective Study Of 109 Cases

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Citation

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Abstract

Summary: The Lichtenstein technique is the "gold standard" in hernia surgery. The aim of this study was to evaluate the results of this process in our conditions.

Patients and methods: we performed descriptive retrospective study over a period of 10 years, with 109 cases of inguinal hernia repair according to the Lichtenstein technique. They were 76 men and 3 women, with an average age of 57.2 years. The hernia was recurrent in 60% of the cases. The seat of the hernia was unilateral in 62% of the cases.

Results: spinal anesthesia was used in 93.5% of the cases. The hernia was indirect in 52% of the cases and direct in 42% of the cases. According to Nyhus, type III was found in 60% of the cases. Morbidity rate was 12%. They were 6 cases of scrotal and parietal hematoma and 2 cases of wound infections. The rate of recurrence and chronic pain were identical (0.9%).

Conclusion: the morbidity of the Lichtenstein technique is low even under conditions of various grades of difficulty.

INTRODUCTION

Several surgical techniques exist in the treatment of inguinal hernias in adults. Nowadays, the Lichtenstein technique is a method that uses a prosthesis to close and reinforce durably the posterior wall of the inguinal canal in order to reduce the risk of recurrence. It is a tension-free technique, now considered the "gold standard" in hernia surgery [1, 2, 3]. Aim of the study was to discuss the advantages and limits of the Lichtenstein technique compared to other tension-free techniques in our context.

MATERIALS AND METHODS

This is a descriptive and retrospective study over a period of 10 years (January 2003 to December 2013) including 109 repairs of uncomplicated inguinal hernias according to the Lichtenstein technique at the General Surgery Department of the University Hospital Center Aristide Le Dantec in Dakar.

Clinical data

There were 76 men and 3 women. Mean age was 57.2 years with extremes of 26 years and 88 years. Forced labor was found in 21 cases (26.6%). The various risk factors found are represented in Table I. Forty-one patients (60%) had a recurrence. The hernia was bilateral in 38 cases (38%).

Table 1

Distribution according to etiological factors

Etiological factors	Number	Percentages %
Forced labor	21	26,6
Strength sport	2	2,5
Tobacco	6	7,6
Chronic constipation	7	8,9
Chronic cough	4	5
Chronic dysuria	2	2,5
Without risk factor	37	46,8
Total	**79**	**100**

Operating data

Spinal anesthesia was used in 73 cases (92.4%), general anesthesia in 4 cases (5.1%) and local anesthesia in 2 cases (2.5%).

Antibiotic prophylaxis with amoxicillin-clavulanic acid was

used in all cases.

The technique consisted of closing the posterior wall of the inguinal canal with a polyester (59%) or polypropylene (41%) prosthesis. The prosthesis was cut with a conical shape and a slot for the passage of the cord (Figure 1). It was fixed successively to the pubic spine (Figure 2).

Figure 1

Cutting of the prosthesis

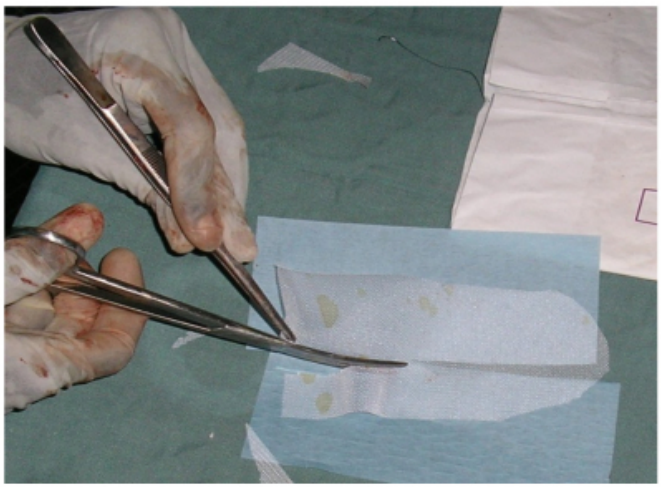


Figure 2

Fixing to the pubic spine

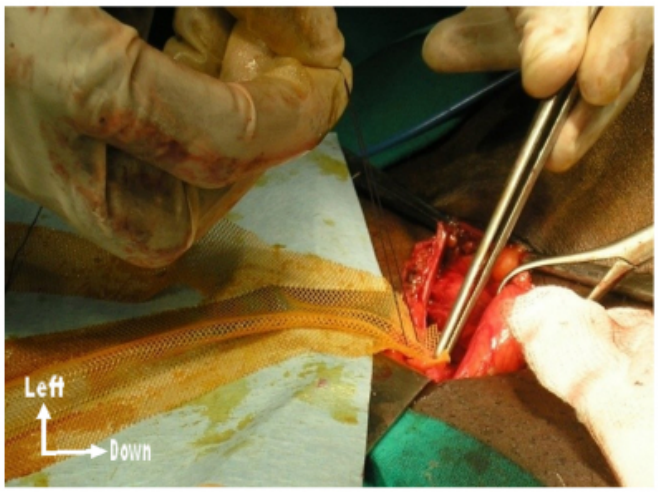
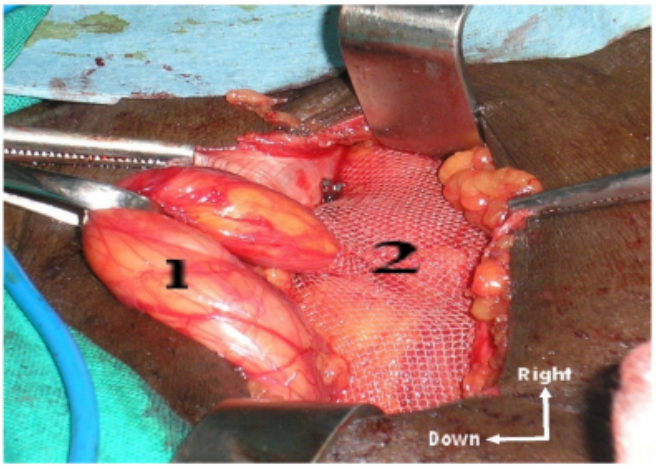


Figure 3

Placement of the prosthesis (final aspect) 1. Spermatic cord. 2. Prosthesis fixed under the cord



- at the inguinal ligament by a nonabsorbable suture,

- at the joint tendon by separate points to the nonabsorbable suture (Figure 3).

RESULTS

Anatomically, the hernia was indirect in 57 cases (52%). The following table summarizes the different anatomical types (Table II).

Table 2

Distribution of hernias by anatomical type

Anatomical type	Number	Percentage %
Indirect hernia	57	52
Direct hernia	46	42
Crural hernia	03	03
Mixed hernia	03	03
Total	**109**	**100**

According to the Nyhus classification, the hernia was type III in 68 cases (62%) and type IV in 41 cases (38%).

The Lichtenstein technique with polyester or polypropylene prosthesis was used in all patients. Two peri-operative complications (2.7%) were noted (an accidental sigmoidal injury that was sutured and an arterial lesion of the spermatic cord that was ligated). The morbidity rate was estimated at 12.6% (n=10). Early postoperative complications are summarized in Table III.

Table 3

Distribution of patients according to postoperative complications

Complications	Number	Percentage %
Scrotal hematoma	04	5
Parietal hematoma	02	2,5
Wound infection	02	2,5
Without complications	101	90
Total	**109**	**100**

Follow-up was between 1 year 4 months and 12 years. One case of chronic pain, rated 2/10 according to the Visual Analogue Scale (VAS), was found with a follow-up of 10 years: it was a 32-year-old carpenter who was operated for a recurrent inguinal hernia.

Pain improved under medical treatment, with a VAS of 0/10.

One case of recurrence was noted (0.9%) in a 63-year-old patient undergoing bilateral inguinal hernia repair with a notion of prostatism. No case of death was noted.

DISCUSSION

Hernia pathology is largely related to age. In our series and in the literature, the mean age of patients was between 50 and 60 years old [1, 4, 5]. This can be explained by the weakening of the tissues with age, which can favor recurrence in the treatment with tension. This aspect of the pathology favors the use of a prosthesis [6]. Moreover, the European Hernia Society (EHS) recommends the use of prosthesis in the treatment of inguinal hernias in adults over 30 years of age (Recommendation Grade A).

Other aspects in favor of prosthesis are related to the existence of dynamic risk factors. In fact, the prosthesis provides a dynamic and tension-free closure of the posterior wall of the inguinal canal, thus reducing the risk of chronic pain and recurrence during laborous work [6].

In our study, the mean age and strength activities (work and sport strength), which represented 29.1%, are a good indication of the advantages of the prosthetic treatment.

Indications

Main indication for the treatment of inguinal hernias by prosthesis in our region is the fact of recurrence. Initial treatment is almost always a herniorraphy. This situation requires difficult dissection and poor recognition of the structures of the inguinal region [3]. Our result are different from those in the Western literature where recurrence represents a rare indication of the Lichtenstein technique.

Maggiore et al report a recurrence rate of 13.7% and the Liem team a rate of 12% in a series of 507 patients and for four techniques of anterior approach (Bassini, Mac Vay, Shouldice, Lichtenstein) [7, 8]. Sixty percent of our patients had recurrence after primary herniorrhaphy. In the literature, the technique used in the initial treatment is not always specified [7, 8]. However, in case of recurrence, the EHS recommends surgery by a laparoscopic approach when the anterior approach was used during the initial treatment [9].

Technique

The Lichtenstein method is a simple technique that involves closing the posterior wall of the inguinal canal with a prosthesis of prolene or polyester (foreign body) [1, 2, 3]. The prosthesis is cut into a conical shape and split at its base to create two straps to allow the passage of the spermatic cord. First the prosthesis is attached to the pubic spine and the edges are sutured to the inguinal ligament and joint tendon. The prosthesis is fixed behind the cord in the preperitoneal space [1, 3]. It is a simple and fast technique [7, 10]. Main problems in our study were recurrences, because the recognition of anatomical elements is difficult and long which lengthens the operating time and the risk of vascular, nervous, or visceral lesions.

Spinal anesthesia was the most commonly used type of anesthesia in our study. This result is similar to those of most authors [3, 7, 8, 11]. Choice of locoregional anesthesia is mainly explained by its advantages over general anesthesia, because of fewer general complications. It also allows for a good intraoperative evaluation of the effectiveness of the treatment by making the patient cough. This result shows that the Lichtenstein technique has a certain advantage over laparoscopic techniques. Results of the Liem team confirm this hypothesis with more general complications in the posterior approach techniques [8]. However, local anesthesia has more advantages because it allows outpatient surgery and reduces hospital stay [1]. In a series of 398 patients, Marre et al report a rate of 72.6% local anesthesia against 21.6% spinal anesthesia [5]. The same author reports in a series of 98 patients the exclusive use of local anesthesia in the treatment using the Lichtenstein technique [1].

Antibiotic prophylaxis was systematic in our study for the prevention of infections which is important in our context. This attitude is reported by the Cuetto team. However, the infectious risk does not seem to decrease significantly [12].

In a meta-analysis including 2507 patients in 6 comparative studies, Sanabria et al report a decrease of only 1.5% in the risk of wound infection by antibiotic prophylaxis [13]. In addition, a meta-analysis by Sanchez et al did not show a significant difference in the risk of infection, which is 1.4% in the case of antibiotic prophylaxis against 2.9% in the absence of prophylaxis [14]. These data confirm those of the EHS, which stipulates, with a good level of proof, that this practice does not significantly reduce the risk of infection in low-risk patients [Simons]. Thus, antibiotic prophylaxis should only be used in case of obvious risk factors for infection [9].

Early complications

Anterior approaches such as the Lichtenstein's technique increases the risk of some complications. Two cases (2.5%) of wound infection were found in our study. Wound infections have been reported in other studies but at more or less negligible rates [1, 5, 15]. In other studies, no infections were noted [4, 16].

In our series, a hematoma was noted in 6 cases (6.5%). This is a complication related to a lack of haemostasis in inguinal hernia surgery. Therefore, it is mainly observed in the anterior approach, requiring extensive dissection and thus more difficult haemostasis [17, 18, 19]. This corresponds to the results of the Hay study where a hematoma was observed in between 3.6% and 8.3% of conventional raphies [20]. Maggiore et al. confirmed this fact by reporting higher rates of 14.7% for the Bassini technique against 8.9% for the Lichtenstein technique [7]. The highest rates were recorded by Carbajo and al [21]. This is not a trivial complication. Indeed, it can be voluminous and increase the risk of infection, thus requiring immediate evacuation in the operating room [22].

Chronic Pain

In our series, the chronic pain rate was 0.9%. A higher rate was reported by Maggiore et al. (3%) [7]. Chronic pain results from multiple factors. The two most common reasons are sutures and the foreign body causing an inflammatory reaction, which causes retractile fibrosis damaging the ilioinguinal and ilio-hypogastric nerves [23, 24]. This inflammatory reaction may be more exaggerated in the nerve and cause a neuroma whose treatment may be surgical excision [7]. Moreover, Marre et al reported two cases of prosthetic ablation for disabling chronic pain [1]. The role of nerve damage related to prosthesis, in the genesis of chronic pain, is confirmed by Mohanapria et al, who reported a clear decrease in the rate of chronic pain in neurectomy compared to the preservation of ilioinguinal and ilio-hypogastric nerves. [23]. The same results were reported by Pisanu et al [25]. This shows that laparoscopic techniques have an advantage compared to the Lichtenstein technique. These are the Trans-Abdomino-Pre-Peritoneal (TAPP) and Totally Extra-Peritoneal (TEP) techniques that allow the closure of the internal orifice of the inguinal canal by a prosthesis, away from both nerves [8, 26]. Autoplasties due to the absence of foreign body also protect against this type of lesion [27, 28, 29].

Recurrrence

Recurrence rate was 0.9% in our series and corresponds to the data found in the literature [1, 4, 10, 11, 30]. This result is related to the principle of "tension-free" Lichtenstein technique. However, defenders of endoscopic techniques believe that abdominal pressure tends to separate the edges of the prosthesis and the boundaries of the inguinal region. Thus, the prosthesis can lose 30% of its surface and expose to recurrences [26]. Indeed, the endoscopic techniques respond better to the pathophysiology of an inguinal hernia, because the abdominal pressure allows to apply the prosthesis against the wall, which is not the case in the Lichtenstein technique. However, recurrence rates between the two techniques are not significantly different [25, 30, 31, 32, 33].

Autoplasties using fascial flaps are also « tension-free » techniques. These are aponeurotic plasty of the oblique externe muscle (Desarda Technique) and of the rectus abdominis muscle (Vayre Petit Pazos technique) [27, 29]. These techniques have the advantage, compared to the Lichtenstein method, because they do not lead to inflammatory fibrosis due to the absence of foreign body and do not to require systematic antibiotic prophylaxis to a reduced risk of infection. Operating costs are increased by the cost of the prosthesis which varies between 60$ and 110$ in our region. Moreover, the recurrence rates reported by the different authors are comparable to those of the Lichtenstein technique [27, 28, 29].

CONCLUSION

The Lichtenstein technique is the « gold standard » in inguinal hernia surgery because of its advantages over conventional techniques. However, the results are comparable to those of laparoscopic techniques and apo-

neuroplasty in terms of chronic pain and recurrence. The cost of the prosthesis is also a limitation to the use of a prosthesis. Apo-neuroplasty plays therefore an increasing role in the treatment of inguinal hernias in developing countries.

References

1. Marre P, Pitre J, Timores A. Treatment of adult's inguinal hernia by Lichtenstein Procedure. Results after 10 years. e-mémoires de l'Académie Nationale de Chirurgie 2009;8 (2):46-47.
2. Amid PK. Lichtenstein tension free hernioplasty: its inception,evolution and principles. Hernia 2004;8:1-7.
3. Cissé M, Sylla MS, Konaté I et al. Cure en un temps des hernies inguinales bilatérales par la technique de Lichtenstein. J Afr Chir Digest 2010;10(2):1090-93.
4. Sakorafas GH, Halikias I, Nissotakis C, Kotsifopoulos N et al. Open tension free repair of hernias, the lichtenstein technique. BMC Surgery 2001;1:3.
5. Marre P, Damas JM, Penchet A, Pélissier EP. Traitement de la hernie inguinale de l'adulte : résultats des réparations sans tension. Ann Chir 2001;126:644-648.
6. Pélissier E. Etat actuel du traitement de la hernie inguinale. e-mémoires de l'académie nationale de chirurgie 2009;8(2):31-33.
7. Maggiore D, Muller G, Hafanaki J. Bassini vs Lichtenstein : two basic techniques for inguinal hernia treatment. Hernia 2001;5(1) :21-24.
8. Liem MSL, Van der Graaf , Van Steensel J et al. Comparison of conventional anterior surgery and laparoscopic surgery for inguinal hernia repair. N Engl J of Med 1997;336(22):1541-1547.
9. Simons MP, Aufenacker T, Bay nielson B, Bouillot JL, Campanelli G et al. European hernia society guidelines on the treatment of inguinal hernia in adult patients. Hernia 2009;13:343-403.
10. Szopinski J, Dabrowiecki S, Pierscinski S, et al. Desarda Versus Lichtenstein Technique for Primary Inguinal Hernia Treatment: 3-Year Results of a Randomized Clinical Trial. World J Surg 2012;36(5):984–992.
11. Hernández-Granados P, Ontañón M, Lasala M, Garcia C, Argüello M, Medina I et al. Tension-free hernioplasty in primary inguinal hernia. A series of 2054 cases. Hernia September 2000, Volume 4, Issue 3, pp 141–143 | Cite as
12. Cueto Rozon R, De Baerdemacker Y, Polliand C, Champault G. L'enseignement de la chirurgie influence-t-il les résultats des cures de hernies de l' aine ? Surgical training and inguinal hernia repair Annales de chirurgie 131 (2006) 311–315
13. Sanabria A, Carlos Domı´nguez L, Valdivieso E, and Go´mez G. Prophylactic Antibiotics for Mesh Inguinal Hernioplasty. A Meta-analysis Annals of Surgery • Volume 245, Number 3, March 2007
14. Sanchez-Manuel FJ, Seco-Gil JL. Antibiotic prophylaxis for hernia repair. Cochrane Database Syst Rev 2009.
15. James E, McGillicuddy MD. Prospective randomized comparison of the Shouldice and Lichtenstein hernia repair procedures. Arch Surg 1998;133:974-978.
16. Phatchara H, Chumpon W, Kunlanid C, Nateecha P, Oraphan P, Ninatthanan P. omparative Study of Tailor-made Mesh Plug Herniorrhaphy Versus Lichtenstein Herniorrhaphy Versus Bassini Operation: A Prospective Clinical Trial. Asian J Surg 2006;29(2):74 – 8
17 Desarda MP. Physiological repair of inguinal hernia: a new technique (study of 860 patients). Hernia 2006;10:143–146.
18. Koning GG, Koole D, Vriens PWHE. Transinguinal preperitoneal hernia correction vs Lichtenstein's technique; is TIPP top? Hernia 2011;15(1):19-22.
19. Manyilirah W. Comparison of non-mesh (Desarda) and mesh Methods for inguinal hernia repair at Mulago hospital. A double-blind randomized controlled trial. Hernia 2012;16(2):133-144.
20. Hay JM, Boudet MJ, Pourcher J et al. Shouldice inguinal hernia repair in the male adult : the gold standard? Ann Surg 1997;222(6):719-727.
21. Carbajo MA, Martin del olmo JC, Blanco JI, Cuesta C et al. Laparoscopic treatment vs open surgery in the solution of major incisional and wall hernias with mesh. Surg Endosc 1999;13:250-252.
22. Vuilleumier H, Abrazhda D, Hubner M. Algies après cure de hernie inguinale : Que faire.
Rev Med Suisse 2010;6:1288-1291.
23. Mohanapriya T, Karthikeyan TR, Balaji Singh K, Arulappan T. Ilio inguinal neurectomy in inguinal hernia International Surgery Journal Mohanapriya T et al. Int Surg J. 2017; 4(9):2977-82
24. Malekpour F, Hadi Mirhashemi S, Hajinasrolah E, Salehi N, Khoshkar A, Asghar Kolahi A. Ilioinguinal nerve excision in open mesh repair of inguinal hernia—results of a randomized clinical trial: simple solution for a difficult problem? DThe American Journal of Surgery (2008) 195, 735–740
25. Edmond Estour. Traitement des hernies de l'aine - Apport de la coelio-chirurgie. Treatment of Inguinal Hernias - Important Place of Coelio-surgery. e-mémoires de l'Académie Nationale de Chirurgie, 2016, 15 (4) : 075-079
25. Pisanu A1, Podda M, Saba A, Porceddu G, Uccheddu A. Meta-analysis and review of prospective randomized trials comparing laparoscopic and Lichtenstein techniques in recurrent inguinal hernia repair. Hernia. 2015 Jun;19(3):355-66. doi: 10.1007/s10029-014-1281-1. Epub 2014 Jul 18.
26. Phe V, Bitker MO , Misrai V, Richard F. Cure de hernie inguinale selon la technique de Vayre Petit Pazos: Etude retrospective à propos de 83 patients consécutifs. e-mémoires de l'Académie Nationale de Chirurgie 2008;7(2):26-32.
27. Dieng M, Cissé M, Seck M, Diallo FK, Touré AO, Konaté I, Ka O et al. Cure des hernies inguinales simples de l'adulte par plastie avec l'aponévrose du grand oblique : technique de Desarda.
e-mémoires de l'Académie Nationale de Chirurgie 2012;11(2):69-74.
28. Desarda MP. New method of hernia repair a new solution. ANZ J. Surg 2001;71:241-244.
29. Mayagoitia JC, Chavez EPD, Suarez D, Cisneros HA et al. Predictive factors comparison of complications and recurences in three tension-free herniorraphy techniques. Hernia 2006;10:147-151.
30. Mayagoitia JC, Chavez EPD, Suarez D, Cisneros HA et al. Predictive factors comparison of complications and recurences in three tension-free herniorraphy techniques. Hernia 2006;10:147-151.
31. Liem MSL, Duyn EBV, Graaf YVD. Vroonhoven TJV, Coala Trial Group. Recurrences after conventional anterior and laparoscopic inguinal hernia repair a randomized comparison. Annals of surgery 2003;237(1):136–41
32. Pedroso LM, De-melo RM, Da-silva-jr NJ. Comparative study of postoperative pain between the lichtenstein and laparoscopy surgical techniques for the treatment of unilateral primary inguinal hernia. ABCD Arq Bras Cir Dig.

2017;30(3):173-174
33. Shazi B, Koto MZ. Comparing outcomes after laparoscopic totally extraperitoneal repair versus open (lichtenstein) repair of inguinoscrotal hernia at dr george mukhari academic hospital. s afr j surg. 2017 jun;55(2):75-76.

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