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Management of Inguinal Hernia in Adults in a Community Setting: The Case of the Commune I Reference Health Center of Bamako

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Abstract **Original Research Article**

The aim was to study and analyse the results of surgical treatment of inguinal hernia in a community setting. We conducted a prospective descriptive study from 1st January 2021 to 31 December 2021 in the general surgery department of the Commune I referral health centre. A total of 74 patients underwent surgery for inguinal hernia. Inguinal hernia accounts for 6% of surgical consultations. Males were the most represented, with a sex ratio of 13.3; the mean age was 50.39, with extremes ranging from 18 to 86 years. Farmers, shopkeepers and workers accounted for 46%. In 40.5% of cases, patients consulted for inguinal swelling. Preoperatively, the hernia was complicated in 13.5% (10) of patients. Hernial strangulation was the main preoperative complication in 13.5% (10). Treatment was essentially surgical; local anaesthesia was used in 75.7% of our patients, general anaesthesia in 5.4% and locoregional in 18.9%. The Shouldice technique was used in 99% of cases, the operative follow-up was simple in 44.6%, and the presence of keloids in 1.4%. Conclusion: The Shouldice technique was the technique of choice for inguinal hernia repair in community settings in developing countries because of its results and its affordability compared with other techniques using medical devices.

Keywords: Inguinal hernia, Shouldice technique, community setting.

INTRODUCTION

An inguinal hernia is a permanent or intermittent spontaneous discharge of viscera through a zone of anatomical weakness in the abdominal wall. It exits through an area of weakness in the groin: the musculopectinal hiatus [1]. The discovery of groin hernia is very old, as attested by certain documents found in ancient Egypt, but it was not until the end of the 19ème century that the first surgical repairs were described [2]. By far the most common, it is one of the most widespread surgical conditions. It occurs mainly in men, with two peaks in frequency: in the neonatal period and from the age of 50 [3]. In Mali, Samaké H. found that 5.98% of patients hospitalised in Bamako hospitals, all wards combined, suffered from groin hernia [4]. It accounts for 10% of compulsory surgical procedures. It is one of the most frequent pathologies in general surgery, particularly in Africa where it affects 4.6% of the population [5]. Inguinal hernias account for 95% of groin hernias [6]. Although the diagnosis of inguinal hernias is straightforward, the management of these hernias is still debated. The treatment of inguinal hernias today raises the question of choosing between several surgical techniques offering comparable clinical results but different functional and economic outcomes [7]. In 1996 Simons concluded that the Shouldice procedure is the best conventional technique for inguinal hernia repair [8]. There is no consensus on the ideal technique for inguinal hernia repair [9]. The seriousness of this condition is linked to the occurrence of strangulation, which accounts for 10% [10] and is the main complication. The objectives were to study and

analyse the outcome of surgical treatment of inguinal hernia in a community setting.

MATERIALS AND METHODS

The study took place in the general surgery department of the Commune I referral health centre in Bamako. It was a prospective study running from 1er January 2021 to 31 December 2021, i.e. a duration of 12 months. All adult patients (18 and over) admitted and operated on for inguinal hernia in the department were included in our study. Inguinal hernias in children and all inguinal hernias not operated on in the department were excluded from the study. Data were collected using survey forms which were filled in from the pre-established files for each patient, the consultation register and the operative report books. Patients were sought out by telephone. This methodology enabled us to see the majority of our patients again. The data was entered using Excel and Microsoft Word and analysed using Epi infos software; the statistical tests used were the Chi-square; a P value of less than 0.05 was considered significant.

RESULTS

We operated on 74 patients for inguinal hernia, with an average age of 50.39 and extremes of 18 to 86 years. The majority of our patients were male (93%) and the sex ratio was 13.3 in favour of men. In 50.1% of cases, patients were involved in intense physical activity (farmers, peasants, manual workers, housewives) and 17.6% in intellectual activity (civil servants, pupils, students). The main reason for consultation or referral was inguinal swelling in 40.5% of cases, followed by painful inguino-scrotal swelling in 18.9% of cases. Contributing factors (intense effort) were found in 48.7% of cases. In 51.4% of cases, the inguinal hernia was on the right; in 32.4% of cases, the hernia was on the left and in 16.2% of cases, the hernia was bilateral. Preoperatively, the hernia was complicated in 13.5% (10/74). The patients were operated on under local anaesthetic in 75.7% of cases (56/74). Local anaesthesia was used in 18.9% of cases (14/74) and general anaesthesia in 5.4% of cases (4/74). In 86.5% of cases (64/74) patients were operated on by a qualified surgeon and in 13.5% of cases (10/74) patients were operated on by a D.E.S in general surgery. Intraoperatively, we found that the hernia sac contained the small intestine in 86.5% of cases. Non-absorbable thread was used in 97.2% (72/74) of our patients and absorbable thread in 2.7% (2/74).Over 82.4% of patients did not require hospitalisation. The average length of hospitalisation was 1.3 days, with extremes of 1 to 2 days. The standard deviation was 0.16 days. Immediate post-operative follow-up was straightforward in 97.2% of cases, with haematoma in 1.4% (1/74) and SSI in 1.4% (1/74). At one month post-op, the morbidity rate was 2.7% (2/74), due to residual neuralgia, and 2.7% (2/74) due to delayed healing. The nature of the post-operative complication at 6 months was keloids in 1.4% of cases (1/74). We reviewed 95.9% of our patients (71/74) at 6 months.

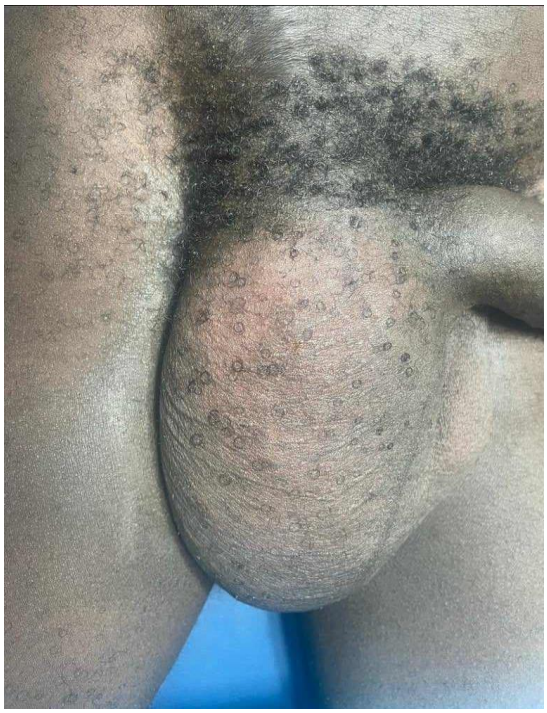

Figure 1: Right inguino scrotal hernia

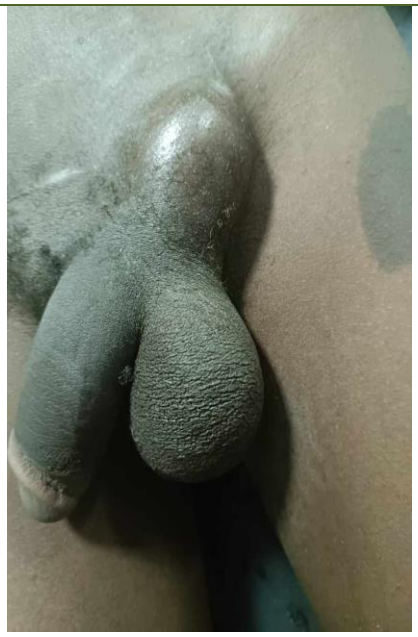

Figure 2: Strangulated left inguinal hernia

Figure 3: Inguinotomy

Figure 4: Opening the bag with grelic contents

Figure 5: Shouldice technical

Figure 6: Closure of the surgical wound

DISCUSSION

We found a high incidence of inguinal hernia in relatively young people with an average age of 50.39 years. Most of these patients were male, with a sex ratio of 13.3. Some authorities have explained this male predominance by an anatomical difference between the two sexes [11]. In men, the inguinal canal is crossed by the cord, which makes it fragile. This is not the case in women, whose inguinal canal contains only the round ligament. In developing countries, this male predominance could also be explained by the difficulty women have in accessing healthcare. This result could be explained by the fact that in Africa, particularly in Mali, the majority of the population lives exclusively from agricultural work, which places great demands on the muscles of the abdominal wall. This is corroborated by the study by Boukinda *et al*., [12] at the Talangai Hospital in Brazzaville, which found an average age of 40.7 years, with a male predominance. In this work, the patients were involved in intense physical activity. The various studies carried out showed that the majority of patients were hard workers, which supports the theory that acquired hernia is linked to repeated physical effort which, each time causing intra-abdominal hypertension, pushes the mobile viscera towards the dehiscent hernial areas where they progressively exteriorize [13]. Age is a risk factor for hernia. In our series, the mean age was 50.39 years, Sangaré [14] and Konaté *et al*., in Dakar [15] reported an average age of 40 and 50.5 years respectively. There is no difference between our study and that of these authors. Gender is a risk factor in relation to the job and the effort involved. In several studies, the male sex has been the most represented.

El Alaoui Morocco 1995 [16] 87.7%, Campanelli [17] 90%, Italy 2006 and Sangare [15] in Mali 93.5%, as well as Harouna [18] in Niger 85.3% have all found a higher frequency of hernial disease in men, which could be explained by the anatomical configuration of the inguinal canal in men. Any factor that can lead to intra-abdominal hyperpressure can be the cause of inguinal hernia [19]. The external oblique form of inguinal hernia is more common. The direct form is associated with weakness of the posterior wall, and is seen mainly in older patients [20]. We report an external oblique hernia rate of 89.2%. This form of hernia represented 77.38% in Dieng [20] (p= 0.0496), 85.71% in the series by Blanc [21] (Chi2= 04, p= 0.5285) and 84.3% for Faik *et al*. [22] (p= 0.4416). There was no difference between our results and those of these authors. The operation is performed under general anaesthetic, particularly for laparoscopic surgery, whereas open surgery is performed under local or locoregional anaesthetic [23]. In the course of our work, we used general anaesthesia in 5.4% of cases, spinal anaesthesia in 18.9% and local anaesthesia in 75.7%. Local anaesthesia was used by other authors such as Campanelli [17] with 66.76% (P=0.4017) and Samuel [24] in Ghana with 71.7% (P=0.7081). Gao Jia-Sen [25] whose study concerned tension-free hernia repair under 100% local anaesthesia, and Oliveira T [26] who used epidural anaesthesia. Today, the treatment of inguinal hernias raises the question of the choice between several surgical techniques (cures under tension; cures without tension) offering comparable clinical results [27].

We used the Shouldice technique in 99% of cases, and the Bassini technique in 1%. It should be noted that the Shouldice technique is usually the reference procedure because of the recurrence rate of less than 1% published by the Toronto team [28]. We did not use prosthetic methods. Sangare [15] and Samake [29] respectively reported 63.1% (p=0.000001) and 68% (P=0.000001) of cases performed using the Shouldice technique. Non-absorbable sutures were used in 97.2% of patients and absorbable sutures in 2.7% of patients for hernia repair. We found no link between the use of non-absorbable sutures and the occurrence of post-operative recurrence. Immediate post-operative follow-up was straightforward in 97.2% of cases, with 1 case of wall abscess and 1 case of haematoma (2.70%). Morbidity is related to the patient's condition, the anaesthetic or the operation itself. Millikan [30] USA 2003 observed 19 cases (1.80%) of haematoma as postoperative morbidity out of 1056 cases (P=0.9115). There was no significant difference in our study. Mortality factors are age and associated pathologies [9]. No deaths were recorded in our study. Other authors, Sangare [15], Gavioli [31] have not reported any deaths. Lubeth [32] reported 1.1% of deaths not directly related to hernia repair but with a concomitant cause. Konate [33] recorded 0.23% of deaths also unrelated to hernia repair. There was no statistically significant difference between our study and those of its authors. We did not observe any cases of recurrence at 6 months. The recurrence rate, the only criterion for evaluating a hernia repair technique, can only be assessed after a minimum of 2 years [34]. 82.4% of patients did not require hospitalisation. The average length of hospitalisation was 1.03 days, with extremes of 1 to 2 days. Some authorities [35] have reported a hospital stay of 3 to 5 days.

CONCLUSION

The management of inguinal hernia in the community poses a huge problem of technical choice; however, the Shouldice technique is the best for curing inguinal hernia in developing countries because of its good results and its low cost compared with other techniques using medical devices (prostheses). It is therefore essential for all surgeons practising in the community to be familiar with this technique.

CONFLICT INTEREST

The authors declare no conflict of interest. The authors have read and approved the final version of the manuscript.

REFERENCES

1. Gainant, A., & Sautereau, D. (1996). Digestive and abdominal pathology. Ellipses /édition marketing.SA.
2. Boudet, M. J. (1997). Diagnosis of inguinal hernias. *Rev Prat.*, *47*(3), 256- 61.
3. Koumare, K. A., Traore, K. A., Diop, D., Ongoiba, N., Bouare, M., & Simpara, D. (1991). Retrospective evaluation of 4539 inguinal hernia cures performed by general practitioners in selected districts in Mali. *Med Afr Noire.*, *38*(2), 137-141.
4. Samake, H. (1995). *Outpatient inguinal hernia surgery in Bamako*. (128 cases) [Th.Med.].Bamako: ENMP, 15.
5. Kingsnorth, A. (2003). Hernias inguinal incisional. *Lancet*, *362*, 1561-71.
6. US census bureau. (1973). Population estimate, 2004. *Statistics by country for inguinal hernia. J.*, 188(3), 308-13.
7. Ananian, P., Barrau, K., Balandraud, P., & Le Treut, Y. P. (2006). Cure chirurgicale des hernies inguinales de l'adulte: enjeux cliniques, fonctionnels et économiques des pratiques chirurgicales. *Journal de Chirurgie*, *143*(2), 76-83.
8. Simons, M. P., Kleijnen, J., Van Geldere, D., Hoitsma, H. F. W., & Obertop, H. (1996). Role of the Should ice technique in inguinal hernia repair: A systematic review of controlled trials and a meta-analysis. *British journal of surgery*, *83*(6), 734-738.
9. Kouame, B.D., Dick, R.K., Ouattara, O., Odehoury, T., Gouli, J.C., & Yao, K. (2006). Descriptive study of inguinal hernias in boys in 584

cases at YOPOUGON University Hospital (Ivory Coast). *J Pediatr Puer., 19*(2), 47-51.

10. El Alaoui, M., Berrada, S., El Mouatacim, K., & Kadiri, B. (1996). Le traitement prothétique des hernies inguinales bilatérales par voie médiane. *Maghreb médical*, (301), 30-31.
11. Brévart, C., Moncade, F., & Bronstein, J.A. (2012). Adult groin hernias. EMC Gastroenterology, 7(1), 1-10.
12. Boukinda, F., Fagniez, P. L., & Julien, M. (1993). Profil épidémiologique des hernies au centre hospitalier de Talangaï à Brazzaville: étude portant sur 260 malades opérés en 12 mois. *Médecine d'Afrique Noire*, *40*(11), 655-661.
13. de Goede, B., Timmermans, L., van Kempen, B. J., van Rooij, F. J., Kazemier, G., Lange, J. F., ... & Jeekel, J. (2015). Risk factors for inguinal hernia in middle-aged and elderly men: results from the Rotterdam Study. *Surgery*, *157*(3), 540-546.
14. Samake, H. (1995). *Outpatient inguinal hernia surgery in Bamako* (128cas) [Th.Med.]. Bamako: ENMP, 15.
15. Konate, I., Cisse, M., Wade, T., Pa, B.A., Tendeng, J., & Sine, B. (2010). Management of inguinal hernias at the hospital's surgical clinic Aristide Le Dentec de Dakar: retrospective study of 432 cases. *J Afr Chir Digest*, *10* (2), 1086-1089.
16. El Alaoui, M., Berrada, S., Elmouatalim, K., & Kadiri, B. (1995). Shouldice technique in the treatment of inguinal hernias. About Shouldice 130 cases at the Ibn Roch University Hospital in Casablanca. *Médecine du Maghreb, 53*, 6-8.
17. Campanelli, G., Pettinari, D., Nicolosi, F. M., Cavalli, M., & Avesani, E. C. (2006). Inguinal hernia recurrence: classification and approach. *Hernia*, *10*, 159-161.
18. Harouna, Y., Seibou, A., Manzo, R., Abdou, I., & Bazira, L. (2000). La hernie inguinale simple de l'adulte: Etude médico-économique à propos de 244 cas. *Médecine d'Afrique Noire*, *47*(6), 292-297.
19. Andrews, N. J. (1981). Presentation and outcome of strangulated external hernia in a district general hospital. *British Journal of Surgery*, *68*(5), 329-332.
20. Dieng, M., Cissé, M., Seck, M., Diallo, F. K., Touré, A. O., Konaté, I., ... & Touré, C. T. (2012). Cure des hernies inguinales simples de l'adulte par plastie avec l'aponévrose du grand oblique: technique de Desarda. *E-mémoires ANC*, *11*(2), 69-74.
21. Blanc, P., Meyer, A., Delacoste, F., & Atger, J. (2011). Treatment of inguinal hernias by totally extraperitoneal laparoscopy (TEP): Does the umbilical-pubic distance influence the technique? *The journal of laparoscopic surgery, 79*, 1-4.
22. Faik, M., Halhal, A., Oudanane, M., Housni, K., Ahalat, M., Baroudi, S., Benamar, A., & Tounsi, A. (n.d). *Local anesthesia in the cure of inguinal hernias at the Ibn SANIA CHU, Rabat, Morocco*
23. Gentili, M.E., Delaunay, L., Planet, F., & Cittanova, M.L. (2012). How should an inguinal hernia be treated on an outpatient basis? The conference. *Pain assessment and treatment. Sfar*.
24. Samuel, D., Schillcut, M.S.C., Michael, G., & Clarke, M.D. (2010). Cost-effectiveness of groing hernia surgery in the western region of GhanaArch. *surg*., *145* (10), 954-961.
25. Gao, J. S., Wang, Z. J., Zhao, B., Ma, S. Z., Ma, Pang, G. Y., & Na, D.M. (2009). Inguinal hernia repair with tension-free hernioplasty under local anaesthesia. *Saudi Med J., 30* (4), 534-536.
26. Oliveira, T., Estrela, T. G., Fernandes, V. L., Carvalho, O. E. D., Gildasio, & Figueiredo, S. G. (2010). Venous and subcutaneous tramadol for inguinal herniorrhaphy: a comparative study. *Journal Brésiliend' anesthésiologie, 60* (5), 522-527.
27. Ananian, P., Barrau, K., Balandraud, P., & Le Treut, Y.P. (2006). Surgical correction of inguinal hernias in adults: clinical, functional and economic issues of surgical practices. *J Chir, 143*(2), 76-83.
28. Glassow, F. (1973). The surgical repair of inguinal and femoral hernias. *Can Med Assoc. 108,* 308-313.
29. Samake, B. (2014). *Inguinal hernias: diagnostic and therapeutic aspects* at CSRéf CI Bamako, FMOS. N°= 14M94.
30. Millikan, K.W., Cummings, B., & Doolas, A. (2003). The modified Millikan mesh hernioplasty form. *Arc Surg., 138* (5), 525-30.
31. Gavioli. (1996). Emergency prosthesis and hernia surgery. *J chir., 133*(7), 317-319.
32. Lubeth, M. (1975). About 1000 cases of groin hernia, 800 of which were treated by lowering with the Cooper. *Thèse de méd. Paris.*
33. Halidou, A. (2008). *Evaluation of the management of simple abdominal hernias at the hospital* of GAO about 103 cases treated surgically in the general surgery department. [Th. Med]. Bamako: FMPOS; n°90.
34. Schumpetick, V., Trumeck, H., & Arlt, G. (1994). Inguinal Hernia repair in adults. *Lancet, 344*, 375- 9.
35. Gerbitz, J., Rose, N., Eberle, C. (2001). Quality control after hernia operation. *Swiss Surg., 7*(3), 105-9.