

Hydrocelectomy Under Local Anesthesia in Rural Areas

Dembélé, O¹, Traoré, S. I², Ballo, B², Traoré, M. T², Deh, A², Dembélé A², Touré, N², Kamissoko, B², Ouattara, A. Z², Coulibaly, S², Berthé, O², Ouattara, K. S², Koné, O², Tembely, A. D²

¹Research Officer, Department of Urology, Sikasso Hospital, 888J+JMW, Sikasso, Mali

²Department of Urology, Sikasso Hospital, 888J+JMW, Sikasso, Mali

DOI: [10.36347/sasjs.2023.v09i05.002](https://doi.org/10.36347/sasjs.2023.v09i05.002)

Received: 09.03.2023 | Accepted: 15.04.2023 | Published: 06.05.2023

*Corresponding author: Dembélé Ousmane

Research Officer, Department of Urology, Sikasso Hospital, 888J+JMW, Sikasso, Mali

Abstract

Original Research Article

The aim of the study was to describe hydrocelectomy under local anesthesia in the health district of Kolondièba. This was a cross-sectional (analytical) study by exhaustive survey. The study took place in two phases: a collection phase from November 6 to November 13, 2017 and a phase devoted to encoding, entry, purification, data analysis and writing from November 20 to November 15, December 2017. Included in this study are all patients operated on for filarial hydrocele, i.e. 42 patients. We proceeded by a purposive sampling by taking all patients with a filarial hydrocele whose age is greater than 11 years. The average age was 59 years old and 78.6% were married men. Farmers accounted for 69%. The duration of evolution of the hydrocele varied between 5 to 10 years. Half of the patients had grade 2 hydroceles. The impact of the hydrocele on their patients' work was found in 69% of cases and 73.8% had an impact on their sexual life. Total vaginal resection using the Winckelmann technique was performed in 90.5% of cases. The average duration of hydrocelectomy was 30 minutes in 97.6% of cases. A significant link between the quantity of fluid and the impact of hydrocele on work was found ($P= 0.010$ which is less than 5%). Filaricelce surgery requires a good knowledge of the anatomy of the male reproductive system, mastery of surgical techniques, potential complications that may arise during the operation and adequate equipment. The vaginal resection technique is the one commonly used, recommended by WAHO and WHO.

Keywords: Hydrocelectomy; local anesthesia; rural environment.

Copyright © 2023 The Author(s): This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC BY-NC 4.0) which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use provided the original author and source are credited.

INTRODUCTION

The hydrocele is a fluid collection developed within a virtual cavity located between the two layers of the vaginal testicle. It is due to an imbalance in the secretion/reabsorption balance of the vaginal mucosa. An exudate collects in the non-communicating vaginal cavity, either by excess secretion or by lack of lymphatic drainage. It is manifested by swelling of the peritoneal membrane surrounding each of the testicles. Generally a pale yellow liquid accumulates in this cavity (the vagina) as a result of the blockage of the lymphatic vessels providing drainage to the retro-peritoneal and sub-diaphragmatic areas. In rare cases the fluid has a milky appearance caused by the presence of lymph [1].

In Africa, the big purse represents 5.5% of specialized urological consultations. Hydrocele is the third most frequent cause of a large bursa (17.8%), behind orchitis-epididymitis (24.3%) and inguino-scrotal hernias (20.0%) [2].

Among the secondary causes of hydrocele, some are in particular more frequent on the African continent: 30 to 40% of patients with lymphedema associated with lymphatic filariasis (*Wuchereria bancrofti*) present with associated hydrocele [3], and tuberculous hydrocele accounts for 7% of cases of urogenital tuberculosis [4, 5]. On the African continent, testicular hydrocele is very common [3]. The high proportion of secondary hydroceles (particularly in filarial endemic areas) and the frequency of "chronic" hydroceles due to a lack of care and/or financial resources [2] make hydrocele a matter of public health in sub-Saharan Africa. France

Those affected live with dreadful socio-economic consequences (aesthetic damage, social exclusion, loss of self-confidence, reduced productivity, sexual dysfunction and family disputes [6-9].

According to the WHO [3], hydrocele surgery should be offered in the most peripheral health services of endemic areas in order to facilitate population access

at an affordable cost. The objective of this study is to evaluate treatment with the total vaginal resection technique (Winckelmann).

MATERIALS AND METHODS

This was a cross-sectional (analytical) study with retrospective collection carried out at the Kolondièba reference health center from November 6 to December 15, 2017.

Were included in the study all patients who agreed to take part in the study and who underwent surgery for Hydrocele in the Kolondièba camp as part of the campaign for the management of hydrocele cases organized by WAHO in 2017.

A multi-part administered face-to-face questionnaire was used to collect the data.

The data entry activity was carried out by the EPI Data 3.1 software.

Statistical analysis of the data was performed by SPSS version 21.0.

The Chi 2 for the qualitative variables and the T-test for the quantitative variables were used as statistical tests. The significance level is $p < 0.05$ and the confidence interval is estimated at 95%.

Surgical management is based on a harmonized technique for the cure of hydrocele according to the West African Health Organization (WAHO) which is the total resection of the vaginal according to the WINCKELMANN technique: Radical technique, dissection of the vaginal, opening and resection at its lines of reflection on the testis. Careful hemostasis and WITHOUT drainage. Dressing with a scrotal suspensory bandage.

The local anesthesia technique is based on blocking the four nerves (ilio-inguinal, ilio-hypogastric, genito-crural and perineal in reverse v) with 2% xylocaine adrenaline which is an attractive and simple technique to practice.

Cord infiltration technique:

Xylocaine 2% (adrenaline), Syringe 10 cc (2 needles)

Lift the cord, left hand; Prick and inject 5 cc of xylocaine along the inner edge of the cord; Repeat the same gesture on its outer edge; Infiltrate the path of the incision (median raphe in general=5 cc)

The goal of treatment is to reduce the disabilities caused by hydrocele through social mobilization, health education and psychosocial support.

The preoperative assessment, the patients are washed and then shaved the day before the intervention.

Pre and postoperative antibiotic therapy based on amoxicillin and metronidazole tablet 500mg at a dosage of 2 amoxicillin capsule and 2 metronidazole tablet the day before and then every 12 hours after the operation.

Ibuprofen 400mg and Paracetamol 500mg were instituted in the postoperative period. Albendazole 400mg (1 tablet) + Ivermectin 600mg depending on the size of the patient.

Postoperative follow-up modality:

Follow-up care: aseptic dressing change, search for signs of hemorrhage on D1 postoperative and local infections from the 3rd day and examination of the scrotum on the 14th day

Long-term follow-up: the first 2 months, at the 6th month then at 12 months

This follow-up is based on history, physical condition and ultrasound if possible. He will appreciate the size of the scrotum, the signs of recurrences, the impact on work, the impact on sex life and financial self-sufficiency.

The result is considered good if the size of the scrotum returns to normal, the resumption of physical activity, normal sexual life and financial self-sufficiency.

RESULTS

The average age of the patients was 59 years old with extremes 12 to 94 years old, 78.6% were married men. Our patients have more than 6 children in 59.5% of cases. Farmers accounted for 69% of our patients. The majority of our patients came from the health district of Kolondièba with 71.4%. The duration of evolution of the hydrocele varied between 5 to 10 years. Half of the patients had grade 2 hydroceles between 250 to 500cc. In 9.5% of cases, the hydrocele was associated with the inguino-scrotal hernia. The impact of the hydrocele on their work of the patients was found in 69% of the cases and 73.8% had an impact on the sexual life. Total vaginal resection using the Winckelmann technique was performed in 90.5% of cases. Two patients underwent orchiectomy for testicular necrosis, all under local anesthesia. In 64.2% of cases, the liquid was citrine yellow. The average duration of hydrocelectomy was greater than 30 minutes in 97.6% of cases. The average length of hospital stay was 24 hours.

The average cost of surgical treatment was 54,000 FCFA. The study concluded that there is a significant link between the quantity of fluid and the

impact of hydrocele on work (P= 0.010 which is less than 5%) and between the age group and sex life (p value at 0.029).

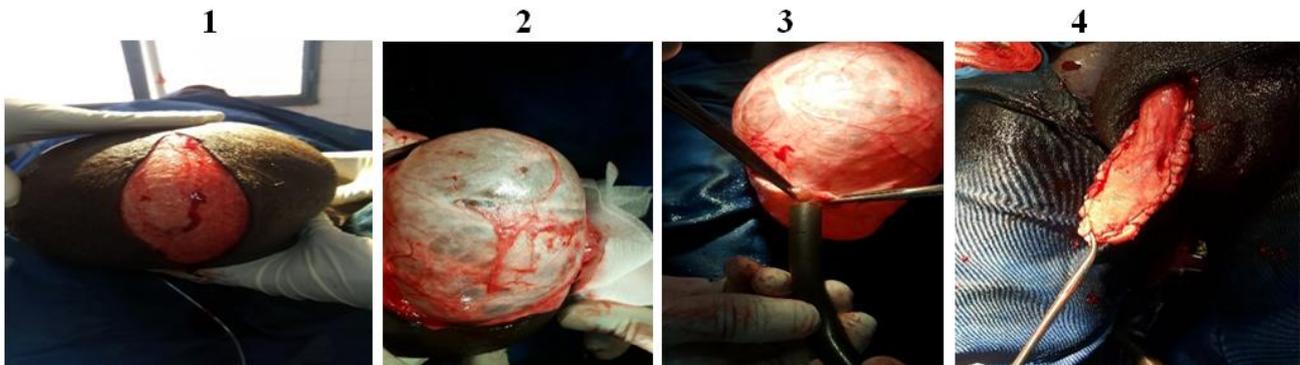
During the same study it was demonstrated that the location of the hydrocele, the duration of evolution and the nature of the liquid have no impact on sexual life with respectively a p value of 0.25; p value at 0.39 and p value at 0.196.



Local anesthesia based on the blocking of the four nerves (ilio-inguinal, ilio-hypogastric, genito-crural

and perineal) with 2% xylocaine adrenaline which is an attractive and simple technique to practice.

WINCKELMANN technique (pictured)





DISCUSSION

The surgery camp for the management of hydrocele cases in the Kolondièba health district allowed us to perform 42 hydrocelectomies from November 6 to 13, 2017.

The frequency of vaginal hydrocele has been confirmed by many African authors: According to Mwobobia IK *et al.*, [11] in hospitals in southern Kenya, hydrocele surgery accounts for 27.6% of all procedures. It reaches 27% in northern Ghana and 16% in district hospitals in Tanzania.

The frequency of adult hydrocele increases with age. The majority of patients are between 30 and 60 years old, i.e. 59.5% with extremes of 12 to 94 years and an average of 59 years. This result is comparable to that found by G.O SANDA *et al.*, in NIGER with an average age of 58.53± 5.7 years and 92% are under 40 years old [12].

Ali J *et al.*, [13] in Pakistan report an average age of 47 years. The series by Rakotoarijaona *et al.*, [14] and Boukinda F [15] include more than 90% of patients aged 41 or over. These results are lower than those of 52.6 years reported by Agbakwuru EA *et al.*, [16] and the average age of our patients.

In our study we did not encounter any failure of local anesthesia. The possibility of performing hydrocele surgery in adults under local anesthesia is confirmed and even recommended by many authors: Reale [17] in Italy, Boukinda F *et al.*, [15], Navaton *et al.*, [18] in Spain.

Using the same technique, some authors have reported failure rates (1.5% of cases) which required conversion to general anesthesia [12]. This conversion would be due to the unaffected four nerves crossing the region.

Our data are consistent with WHO [19] and OAAS recommendations. This study confirms that the surgical procedure is well tolerated by patients.

The treatment of hydrocele has become surgical with plication of the vagina (Lord technique), fenestration of the vagina (Ozdilel technique), total resection of the vagina (Winkelmann technique) and eversion of the vagina (Bergman technique) [19-21, 17, 22, 16].

Gail T *et al.*, [23] performed vaginal eversion in 94% of patients and recorded a recurrence rate of 7% at 10 ng terms. Onol FF *et al.*, [24] report a recurrence rate of 5% after a mini-approach and leaving the residual tunica.

The WHO [19] recommends excision of the abnormal vagina in patients, leaving a border of one centimeter. Hydrocelectomy with resection and hemostasis of the tunic suppresses the secretion of the liquid. All our patients have benefited from resection of the vagina and hemostatic overlock suture. Noroes *et al.*, [22] in a comparative study report a recurrence rate of 19.3% in the group of patients treated by simple reversal without resection of the vagina against a rate of 0.2% among those who underwent resection and vaginal suture. They concluded with a recommendation for the practice of this technique in areas endemic for *Wucheria Bancrofti* filariasis.

Hydrocelectomy by resection and hemostasis of the vagina has more advantages for the patient and remains superior to other techniques [19].

In our study, after one year of follow-up, no cases of recurrence were recorded and the volume of hydrocele was significantly reduced in all patients. No postoperative complications were recorded.

In our study there is an equity between bilateral and right localization with frequencies of 38.7%. This result agrees with the data of several authors on the predominance of bilateral and right localizations: Boukinda F [15] reports in his study 65.2% of predominance on the right, GO SANDO [12] 71% of bilateral localization. 80 and 82% of bilateral localization in the series of Noroes J [25] Agbakwuru et al [16] Capuano GP [26].

In our series, we found 50% grade 2 hydrocele followed by 33.3 grade 3 and 16.7% grade 1. GO SANDO [12] reports 44.77% grade 3.

For our patients, the duration of the hydrocelectomy is greater than 30 minutes in 97.6% of cases.

With a Chi 2 at 9.14 and a $p = 0.010$ less than 5% leads us to conclude that there is a significant statistical link between the amount of fluid and the impact of hydrocele on work

Chi 2 = 4.12 and p value at 0.25 greater than 5% leads to the conclusion that the location of the hydrocele has no impact on sexual life.

With a Chi 2 at 9.06 and p value at 0.029 less than 5% means that age would impact sex life.

Chi 2 at 1.88 and p value at 0.39 greater than 5% means that there is no significant statistical link between the duration of evolution of the hydrocele and the impact on sexual life.

Chi 2 = 4.69 and p value at 0.196 greater than 5% means that the nature of the liquid has no impact on sex life.

CONCLUSION

Filaricele is a pathology that remains frequent in tropical environments due to filarial endemics, its treatment remains surgical. Filaricele surgery requires a good knowledge of the anatomy of the male reproductive system, mastery of surgical techniques, potential complications that may arise during the operation and adequate equipment. The vaginal resection technique is the one commonly used, recommended by WAHO and WHO. The practice of filaricele surgery under local anesthesia for people working in low- and middle-income settings for the management of disease and disability in countries where lymphatic filariasis is endemic must be extended to all the health districts in order to stem this scourge.

Conflicts of interest: None

Ethics:

The agreement of the administrative and health authority (Regional Health Director) was required to conduct the study. Free and informed consent was sought for the participation of patients and their companions. The data collected will remain confidential and will only be used for the purposes of the study.

REFERENCE

- Chiron, P., Amadane, N., Bonnet, S., Laroche, J., Fournier, R., & Savoie, P. H. (2014). Treatment of hydrocele by a general surgeon practicing in a rural resource-poor setting in Africa. *Medicine et sante tropicales*, 24(1), 32-38.
- Ouattara, K., Dafe, S. I., Yakwe, Y., & Cisse, C. (1991). Survey of "big stock markets" in the tropics. About 185 cases. *Black African Medicine*, 38, 850-855.
- Gyapong, M., Gyapong, J., Weiss, M., & Tanner, M. (2000). The burden of hydrocele on men in Northern Ghana. *Acta tropica*, 77(3), 287-294.
- Gueye, S. M., Ba, M., Sylla, C., Ndoye, A. K., Fall, P. A., Diaw, J. J., & Mensah, A. (1998). Epididymal manifestations of urogenital tuberculosis. *Progres en Urologie: Journal de L'association Francaise D'urologie et de la Societe Francaise D'urologie*, 8(2), 240-243.
- El Khader, K., Lrhorfi, M. H., El Fassi, J., Tazi, K., Hachimi, M., & Lakrissa, A. (2001). Urogenital tuberculosis. Experience in 10 years. *Progres en Urologie: Journal de L'association Francaise D'urologie et de la Societe Francaise D'urologie*, 11(1), 62-67.
- Nguyen, L. N., Esterre, P., Lardeux, F., Williams, S. A., & Nicolas, L. (1999). Lymphatic filariasis as an economic and social scourge. *Annales de l'Institut Pasteur Actualites (France)*, 10(1), 93-106.
- Babu, B. V., Nayak, A. N., Dhal, K., Acharya, A. S., Jangid, P. K., & Mallick, G. (2002). The economic loss due to treatment costs and work loss to individuals with chronic lymphatic filariasis in rural communities of Orissa, India. *Acta tropica*, 82(1), 31-38.
- Babu, B. V., Mishra, S., & Nayak, A. N. (2009). Marriage, sex, and hydrocele: an ethnographic study on the effect of filarial hydrocele on conjugal life and marriageability from Orissa, India. *PLoS neglected tropical diseases*, 3(4), e414.
- Ahorlu, C. K., Dunyo, S. K., Asamoah, G., & Simonsen, P. E. (2001). Consequences of hydrocele and the benefits of hydrocelectomy: a qualitative study in lymphatic filariasis endemic communities on the coast of Ghana. *Acta tropica*, 80(3), 215-221.
- World Health Organization (WHO). (2003). Global Program to Eliminate Lymphatic Filariasis. Surgical methods for treating the uro-genital manifestations of lymphatic filariasis. Geneva, 2003; WHO/CDS/CPE/CEE/2002.33
- Mwobobia, I. K., Muniu, E. M., Kombe, Y., & Wamae, C. N. (2000). Hydrocelectomy: a proxy for hydrocele prevalence in coastal Kenya. *Annals of Tropical Medicine & Parasitology*, 94(5), 479-484.
- Sanda, G. O. (2014). Surgical treatment under local anesthesia of vaginal hydrocele in adults in three health districts of Niger: Prospective study about 201 patients. *Annals of Abdou Moumouni University Volume XVII-A*.
- Ali, J., Anwar, W., Akbar, M., Akbar, S. A., & Zafar, A. (2008). Aspiration and tetracycline sclerotherapy of primary vaginal hydrocoele of

- testis in adults. *J Ayub Med Coll Abbottabad*, 20(2), 93-95.
14. Rakotoarijaona, A. (2005). Surgery of vaginal hydroceles at the provincial reference hospital center of Toamasina, Madagascar. *Med Afr N*, 52, (11).
 15. Boukinda, F., & Nervetti, G. (2003, October). L'hydrocèle vaginale. À propos de 55 cas opérés. In *Annales d'urologie* (Vol. 37, No. 5, pp. 293-295). Elsevier Masson.
 16. Agbakwuru, E. A., Salako, A. A., Olajide, A. O., Takure, A. O., & Eziyi, A. K. (2008). Hydrocelectomy under local anaesthesia in a Nigerian adult population. *African health sciences*, 8(3), 160-162.
 17. Reale, C., Corinti, R., Galullo, B., & Borgonuovo, P. (1998). Anesthetic infiltration of the spermatic cord in surgery for voluminous hydrocele. *Archivio Italiano di Urologia, Andrologia: Organo Ufficiale [di] Societa Italiana di Ecografia Urologica e Nefrologica*, 70(3 Suppl), 43-46.
 18. Verdejo, P. N., Fernández, C. Z., Domínguez, F. O., Ballester, F. S., De la Torre Abril, L., Escudero, J. J., & de Campos, M. R. (2005). The treatment of hydrocele as ambulatory surgery. *Archivos espanoles de urologia*, 58(5), 393-401.
 19. World Health Organization (WHO). (2003). Global Program to Eliminate Lymphatic Filariasis. Surgical methods for treating the uro-genital manifestations of lymphatic filariasis. Geneva, 2003; WHO/CDS/CPE/CEE/2002.33
 20. Alhou, S. (2010). Lymphatic filariasis in Niger: results of a preliminary survey. Faculty of Health Sciences of Niamey. Final dissertation, general surgery, Niamey, 50p.
 21. Ahorlu, C. K., Dunyo, S. K., Asamoah, G., & Simonsen, P. E. (2001). Consequences of hydrocele and the benefits of hydrocelectomy: a qualitative study in lymphatic filariasis endemic communities on the coast of Ghana. *Acta tropica*, 80(3), 215-221.
 22. Cerezo, O., & JA, M. G. (2001). Surgical treatment of hydrocele with local anesthesia: 10-year experience. *Archivos espanoles de urologia*, 54(10), 1075-1078.
 23. Thomas, G., Richards, F. O., Eigege, A., Dakum, N. K., Azzuwut, M. P., Sarki, J., ... & Miri, E. S. (2009). A pilot program of mass surgery weeks for treatment of hydrocele due to lymphatic filariasis in central Nigeria. *The American journal of tropical medicine and hygiene*, 80(3), 447-451.
 24. Önlü, Ş. Y., İlbey, Y. Ö., Önlü, F. F., Özbek, E., Arslan, B., & Akbaş, A. (2009). A novel pull-through technique for the surgical management of idiopathic hydrocele. *The Journal of urology*, 181(3), 1201-1205.
 25. Norões, J., & Dreyer, G. (2010). A mechanism for chronic filarial hydrocele with implications for its surgical repair. *PLoS neglected tropical diseases*, 4(6), e695.
 26. Capuano, G. P., & Capuano, C. (2012). Surgical management of morbidity due to lymphatic filariasis: the usefulness of a standardized international clinical classification of hydroceles. *Trop Biomed*, 29(1), 24-38.