

Diagnostic, Therapeutic, and Outcome-Related Features of Strangulated Groin Hernia in Elderly Patients at Bouaké University Hospital

Anzoua KI¹, Ekra AS¹, Assohoun KT^{2*}, Kouakou KB¹, N'Dri AB¹, Bamba I¹, Traoré M¹, Lebeau R¹, Diané B¹

¹Department of General and Digestive Surgery, Bouaké University Hospital (CHU), Côte d'Ivoire

²Department of General and Digestive Surgery, Yopougon University Hospital (CHU), Côte d'Ivoire

DOI: <https://doi.org/10.36347/sasjs.2026.v12i09.009>

| Received: 16.08.2026 | Accepted: 23.09.2026 | Published: 28.09.2026

*Corresponding author: Assohoun KT

Department of General and Digestive Surgery, Yopougon University Hospital (CHU), Côte d'Ivoire

Abstract

Original Research Article

Introduction: Strangulated groin hernia is a common surgical emergency in sub-Saharan Africa. The objective of this study was to describe the clinical, epidemiological, operative, and outcome-related characteristics of this condition in patients aged 60 years and older managed at Bouaké University Hospital. **Patients and Methods:** This case series analysis was based on review of historical hospital records from January 2021 to December 2025. All patients aged 60 years or older who underwent surgery for a strangulated groin hernia were included. **Results:** A total of 123 patients were included, with a mean age of 69.4 years and a male-to-female ratio of 9.2. The mean time to consultation was 5.8 days. Hypertension (42.3%) and diabetes (18.7%) were the most frequent comorbidities. The hernia was inguinal in 87.8% of cases and femoral in 12.2%. Intestinal necrosis was observed in 39 patients (31.7%), leading to intestinal resection in 22.8% of cases and a proximal stoma in 11 patients (8.9%). Overall documented morbidity was 34.1%, mainly represented by surgical site infections (15.4%). Overall postoperative mortality was 9.8%. **Conclusion:** The profile of strangulated hernia in elderly patients in our department highlights a delayed presentation, a high rate of intestinal suffering, and notable perioperative morbidity.

Keywords: Strangulated hernia; Elderly; Bouaké University Hospital; Mortality; Stoma.

Copyright © 2026 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

Groin hernia disease is a common condition that preferentially affects elderly patients because of musculoaponeurotic laxity and tissue structural changes related to senescence [1, 2]. Acute strangulation constitutes the major complication of this condition, exposing the herniated sac content to local ischemic phenomena [3-5].

In sub-Saharan Africa, epidemiological analyses of strangulated groin hernias show that they continue to represent a prominent proportion of abdominal surgical emergencies [6-12]. In elderly patients, this presentation is frequently associated with physiological frailty related to underlying chronic conditions [13-15]. Accurate assessment of these patients during emergency management is essential to guide resuscitation and surgical care [14, 16].

At Bouaké University Hospital, the general surgery department centralizes visceral emergencies for the central region of the country. This study was undertaken to describe the epidemiological, clinical,

intraoperative, and outcome-related profile of strangulated groin hernia in patients aged 60 years and older managed at our institution.

PATIENTS AND METHODS

This was a case series analysis conducted in the Department of General and Digestive Surgery at Bouaké University Hospital over a five-year period (January 2021 to December 2025), based on review of historical hospital records.

Inclusion criteria targeted patients aged 60 years or older admitted and operated on an emergency basis for a groin hernia complicated by intraoperative strangulation. Incomplete records were excluded. Data collected included age, sex, occupation, medical history, time elapsed between symptom onset and hospital admission, anatomical location of the hernia, viability of the incarcerated structures, the parietal repair technique used, occurrence of postoperative complications within 30 days, and patient status at discharge.

Citation: Anzoua, K. I., Ekra, A. S., Assohoun, K. T., Kouakou, K. B., N'Dri, A. B., Bamba, I., Traoré, M., Lebeau, R., & Diané, B. (2026). Diagnostic, Therapeutic, and Outcome-Related Features of Strangulated Groin Hernia in Elderly Patients at Bouaké University Hospital. SAS J Surg, 12(9), 787-790. <https://doi.org/10.36347/sasjs.2026.v12i09.009>

Variables were entered and analyzed using Epi Info software, version 7.2. Results are presented as frequencies and percentages for qualitative variables, and as means with standard deviations or ranges for quantitative variables.

RESULTS

A total of 123 patients were included. The mean age of the series was 69.4 SD7.8 years, with a range of 60 to 91 years. Age-group distribution showed 58 patients (47.2%) between 60 and 69 years, 42 patients (34.1%) between 70 and 79 years, and 23 patients (18.7%) aged 80 years or older. Men accounted for 90.2% of cases (n=111) and women for 9.8% (n=12), corresponding to a male-to-female ratio of 9.2. Farmers made up 58.5% of the study population, followed by traders (19.5%).

Analysis of medical history revealed hypertension in 52 patients (42.3%), diabetes mellitus in 23 patients (18.7%), chronic obstructive pulmonary disease in 16 patients (13.0%), and heart failure in 11 patients (8.9%). Thirty-nine patients (31.7%) presented with a combination of at least two of these comorbidities.

The mean time elapsed before hospital consultation was 5.8 SD4.2 days (range: 1-21 days). A delay of more than 48 hours was observed in 87 patients (70.7%). Factors reported by patients to explain this delay were lack of awareness of potential complications (48.8%), financial or geographic barriers to access to

care (22.8%), and initial recourse to traditional treatment (18.7%).

Topographically, the hernia was inguinal in 87.8% of cases (n=108) and femoral in 12.2% of cases (n=15). Among inguinal hernias, indirect forms accounted for 62.9% (n=68) and direct forms for 37.1% (n=40). The right side was affected in 56.1% of cases, the left side in 39.0%, and bilaterality was noted in 4.9% of observations. The small bowel was the most frequently identified structure within the hernial sac (61.8%), followed by omentum (25.2%), colon (8.9%), and mixed structures (4.1%).

Intraoperative intestinal necrosis was identified in 39 patients (31.7%). Segmental resection was performed in 28 patients (22.8% of the overall series), completed by immediate end-to-end anastomosis in 17 cases (13.8%) and by diversion enterostomy in 11 cases (8.9%). These diversions consisted of 8 ileostomies and 3 colostomies.

Parietal repair was achieved using the Bassini autoplasic technique in 71 patients (57.7%), the Shouldice technique in 32 patients (26.0%), and mesh placement according to Lichtenstein in 20 patients (16.3%). General anesthesia was administered in 55.3% of procedures and spinal anesthesia in 44.7%.

Overall postoperative morbidity was 34.1% (n=42). The distribution of postoperative complications is detailed in Table 1.

Table 1: Distribution of postoperative complications

Postoperative complication	Number (n)	Percentage (%)
Surgical site infection	19	15.4
Cardiopulmonary complications	10	8.1
Secondary incisional hernia	4	3.3
Early hernia recurrence	3	2.4
Thromboembolic complications	2	1.6
Other digestive or stoma-related complications	4	3.3

Mean hospital stay was 8.3 SD5.1 days (range: 2-28 days). Twelve deaths were recorded during the postoperative period, corresponding to a mortality rate of 9.8%. Reported causes included septic shock (6 cases), cardiovascular failure (3 cases), pulmonary embolism (2 cases), and acute respiratory failure (1 case). Among the 39 patients who developed intestinal necrosis, the observed mortality rate was 20.5% (8 deaths). Among the 84 patients without parietal necrosis, this rate was 4.8% (4 deaths). Additionally, the mortality rate was 15.6% among patients admitted after a delay of more than 5 days, compared with 4.3% for those managed before this threshold.

DISCUSSION

This descriptive study documents the epidemiological and clinical features of geriatric strangulated hernia at Bouaké University Hospital. The

profile of our study population is characterized by a mean age of 69.4 years and a marked male predominance (male-to-female ratio of 9.2), which is consistent with observations from other descriptive series in West Africa, notably in Dakar, where Ndong *et al.*, reported a comparable mean age (69.8 years) [1]. The predominance of the inguinal location (87.8%) over the femoral location (12.2%) also corresponds to the usual morphological descriptions of groin hernia disease in adults [2-4, 17].

Delayed access to hospital care is a major feature of this series, illustrated by a mean consultation delay of nearly 6 days (5.8 days) and a substantial proportion of patients (70.7%) admitted after the 48th hour of evolution. Our descriptive data show that this delay is mainly related to a lack of awareness regarding hernia complications (48.8%), financial and geographic

access constraints (22.8%), and initial recourse to traditional medicine (18.7%). These descriptive findings are consistent with the West African literature, such as the study by Dao in Mopti, where lack of awareness of potential complications was reported by 80% of patients [18], as well as with series reported in Benin, Togo, and Mali [7-9, 11].

This prolonged waiting period translates, on the pathological level, into a rate of intestinal suffering and necrosis of 31.7% in our population. This proportion explains the need for intestinal resection procedures (22.8%) [19, 20] and recourse to temporary proximal stomas in 8.9% of patients in the series [7, 20]. In sub-Saharan geriatric surgical practice, enterostomy formation is sometimes an indispensable safety measure, although it notably complicates immediate postoperative care because of the hydro-electrolytic fragility characteristic of elderly patients [14, 15].

Overall postoperative morbidity of 34.1% highlights the importance of parietal infectious complications (15.4%), which rank first among adverse events, followed by cardiopulmonary events (8.1%) [21-23]. This pattern is explained by the context of occlusive surgical emergency and the presence of associated chronic conditions (hypertension and diabetes), which characterize more than one-third of our geriatric cohort [13, 24]. The observed postoperative mortality (9.8%) reflects the overall severity of this complication in elderly patients [13, 25-27]. Our descriptive data show that the proportion of deaths is higher in subgroups of patients with intestinal necrosis (20.5%) [19, 20] or a surgical management delay exceeding 5 days (15.6%) [14, 18].

From a technical standpoint, the predominance of autoplasmic tissue repair according to Bassini (57.7%) reflects departmental practice patterns and local economic constraints [28, 29]. Mesh repair according to Lichtenstein (16.3%) remains uncommon in our series because of the direct cost of implants borne by patients and the caution required in clinical situations involving septic contamination or concomitant intestinal resection [22, 30].

CONCLUSION

This descriptive analysis of strangulated groin hernia in elderly patients at Bouaké University Hospital highlights a prolonged delay in hospital admission, associated with high rates of intestinal necrosis and postoperative morbidity. Mortality during the first postoperative month was high, reaching 9.8%. These descriptive findings underscore the need to strengthen awareness among rural populations regarding the risks of hernia strangulation and to encourage elective surgical repair of uncomplicated hernias, in order to limit recourse to emergency intervention in frail elderly patients.

Declarations

Funding: The authors declare that no funds, grants, or other support were received during the preparation of this manuscript.

Competing interests: The authors declare that they have no relevant financial or non-financial competing interests to disclose.

Ethics approval: This study was conducted retrospectively on data obtained after each patient had received routine clinical care. Ethical approval was waived by the Institutional Ethics Committee of Bouaké University Hospital in view of the retrospective, observational nature of the study and because all procedures performed were part of routine clinical care.

Consent to participate: Written informed consent was obtained from all patients, or their legal representatives, prior to inclusion in this case series.

Consent for publication: Written informed consent for publication of clinical details was obtained from all patients, or their legal representatives.

Authors' contributions: AKI and EAS designed the study; AKT, KKB and NAB collected the data; IB, MT and RL analyzed the data; RL and BD supervised the work and revised the manuscript. All authors read and approved the final manuscript

REFERENCES

1. Ndong A, Sine B, Faye M, *et al.*, Diagnostic, therapeutic, and outcome-related features of inguinal hernia in patients over 60 years of age. *Pan Afr Med J.* 2020;37:159.
2. Femoral hernia in the elderly. *Rev Med Suisse.* 2018;14:1204-1208.
3. Inguinal hernia. In: MSD Manuals, Professional Edition [Internet]. 2024 [cited 2026]. Available from the internet.
4. Strangulated groin hernias. *AMUB - Rev Med Brux.* 2014;35:289-294.
5. HerniaSurge Group. International guidelines for groin hernia management. *Hernia.* 2018;22(1):1-165.
6. Boukinda F, Fagniez P. Epidemiological profile of hernias at Talangai Hospital Center in Brazzaville. *Med Afr Noire.* 2020;67(8):412-418.
7. Adamou H, Magagi IA, Habou O, *et al.*, Management of strangulated groin hernias in adults: a report of 295 cases (Benin). *J Afr Chir Dig.* 2003;3(2):89-94.
8. Management of groin hernias at CHU-Kara (Togo). *Eur Sci J.* 2021;17(21):112-120.
9. Strangulated inguinal hernias at the Bougouni referral health center. *Bibliosante.* 2019;12(1):45-51.

10. Uncomplicated groin hernias in a district hospital in Cameroon. *Health Sci Dis (HSD)*. 2022;23(4):56-61.
11. Clinical and therapeutic features of inguinal hernia in Mali. *Bibliosante*. 2020;13(2):77-83.
12. Digestive surgical emergencies at a health center in Madagascar. *Jaccr Africa*. 2023;7(1):14-19.
13. Abdominal emergencies in the elderly: a report of 113 cases. *Ann Chir*. 2015;140(3):145-152.
14. Perioperative management of abdominal emergencies in the elderly. *Le Praticien en Anesthésie Réanimation*. 2015;19(4):201-209.
15. Emergency surgery in the elderly. *Toubkal Portal - Medical Theses*. 2018;5(2):14.
16. Acute abdomen in the elderly. *Onclepaul - FMC Chirurgicale*. 2021 [cited 2026].
17. Alvarez JA, Baldonado RF, Bear IG, *et al.*, Incarcerated groin hernias in adults: presentation and outcome. *Hernia*. 2004;8(2):121-126.
18. Dao ML. Strangulated inguinal hernias at Sominé Dolo Hospital in Mopti. Thesis in Medicine, University of Bamako; 2012.
19. Intestinal resection for strangulated inguinal hernia. *African Index Medicus*. 2016;22(1):34-39.
20. Therapeutic and outcome-related aspects of intestinal obstruction. *Recac*. 2020;3(11):142-148.
21. Surgical site infections: prevention and management. *EM-Consulte - Traité de Chirurgie*. 2022;4(1):1-12.
22. Indications for groin hernia repair: morbidity and mortality. *EM-Consulte - Techniques Chirurgicales*. 2017;8(2):1-15.
23. Complications of surgical management of nontraumatic acute abdomen. *PubMed Central (PMC)*. 2018;13(4):e0195.
24. Sankar A, Johnson SR, Beattie WS, Tait G, Wijeyesundera DN. Reliability of the American Society of Anesthesiologists physical status scale in clinical practice. *Br J Anaesth*. 2014;113(3):424-432.
25. Sessou R. Management of strangulated hernias. Doctoral thesis in Medicine, Assane Seck University of Ziguinchor; 2024.
26. Strangulated inguinal hernias. Faculty of Medicine, Cadi Ayyad University. Marrakech; 2019.
27. Nilsson H, Stylianidis G, Haapamäki M, Nilsson E, Nordin P. Mortality after groin hernia surgery. *Ann Surg*. 2007;245(4):656-660.
28. Tendeng JN, Ndong A, Dia DA, *et al.*, Tension-free autoprosthesis repair using an external oblique aponeurosis flap in strangulated inguinal hernias in adults at Saint-Louis University Hospital, Senegal. *Recac*. 2021;4(20):88-95.
29. Inguinal hernia in sub-Saharan Africa: what place for the Shouldice technique? *PubMed Central (PMC)*. 2015;10(2):123-128.
30. Haute Autorité de Santé (HAS). Opinion of the Committee for the Evaluation of Products and Procedures: Inguinal hernia. Paris: HAS; 2004.