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Surgical Abdominal Wall Pathologies in Adults: Epidemiological, Diagnostic and Therapeutic Aspects at the Suru-Lere University Teaching Hospital (CHUZ-SL), Cotonou, From 1 January 2022 to 31 December 2024

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Abstract | **Original Research Article**

Background: Surgical disorders of the abdominal wall constitute a substantial component of general surgical practice. Among them, abdominal wall hernias and postoperative incisional hernias are the most predominant. This study aimed to describe the epidemiological, diagnostic and therapeutic characteristics of abdominal wall surgical pathologies at the Suru-Lere University Teaching Hospital in order to improve patient care. ***Methods:*** We conducted a retrospective, descriptive, cross-sectional study including 128 patients who underwent surgery for abdominal wall pathologies at CHUZ-SL over a three-year period, from 1 January 2022 to 31 December 2024. ***Results:*** Among the 624 patients operated on during the study period, 128 met the inclusion criteria (20.51%). The mean age was 48,27±15,93. The most represented age group was 25–50 years (48.44%). Men were predominant (59.38%) and craftsmen and manual labourers formed the largest occupational category (35.16%). The majority of patients resided in urban areas (82.81%), identified mostly as Christian (82.81%), and had attained higher education (32.81%). Parietal swelling was the leading presenting symptom (50.78%). Most patients were admitted as emergencies (67.19%) with nausea the most common functional symptom (53.12%). Right inguinal hernia was the main clinical diagnosis (23.47%). Mesh repair was the most frequently performed procedure (76.56%). The outcome was favourable in most cases (96.88%). ***Conclusion:*** Abdominal wall pathologies are frequent in general surgical practice. Diagnosis is primarily clinical, although imaging may be required in selected cases. Treatment remains surgical.

Keywords: Abdominal wall pathology; mesh repair; surgery.

INTRODUCTION

Abdominal wall surgical pathologies constitute a significant proportion of general surgical practice across both high-income and resource-limited settings. Abdominal wall hernias and postoperative incisional hernias are consistently reported as the most frequent disorders [1,2]. These conditions can cause significant discomfort, pain and may progress to life-threatening complications such as strangulation or bowel necrosis [3–5].

Globally, the prevalence of inguinal hernias is estimated at 5–10% in adult men and approximately 2% in women [3]. Reported rates are higher in sub-Saharan Africa, likely due to intense physical activity, delayed consultation, and limited access to surgical care [5–7].

Incisional hernias represent a major postoperative complication, with an incidence rate reported between 10% and 20% after laparotomy. However, their repair remains challenging in many hospital contexts [4].

Although diagnosis is primarily clinical, ultrasonography or CT scan may be helpful in atypical or recurrent cases. Surgical repair is the standard treatment, with current trends favouring mesh reinforcement of the abdominal wall [2,4].

As a major first-line referral hospital, Suru-Lere University Teaching Hospital (CHUZ-SL) manages a substantial number of patients with abdominal wall pathologies each year.

MATERIALS AND METHODS

A retrospective, descriptive cross-sectional study was conducted from 1 January 2022 to 31 December 2024.

Inclusion criteria were all patients who underwent surgery for abdominal wall pathology at CHUZ-SL and whose medical records were usable. Non-inclusion criteria were patients who underwent surgery for a non-abdominal wall pathologies and/or with incomplete medical records.

Exclusion criteria were all patients who underwent surgery for abdominal wall pathology but aged below 18 years and patients operated elsewhere for abdominal wall pathology and referred to CHUZ-SL solely for postoperative complications. Sampling was random and simple.

Five categories of variables were collected:

- **Sociodemographic:** age, sex, occupation, residence, religion, educational level.
- **Clinical:** chief complaint, mode and timing of admission, past medical/surgical history, clinical signs and symptoms.
- **Paraclinical:** laboratory tests and imaging.
- **Therapeutic:** type of anaesthesia, routes of administration, intraoperative findings and operative procedures.
- **Outcomes:** postoperative evolution, complications, recurrence, mortality, length of hospital stay.

Data collection was carried out using a digital form on the KoBoToolbox (KoboCollect) platform. Sources included operative registers, medical records and operative notes.

Data entry and analysis were performed using Microsoft Excel 2021, and Epi Info version 7.2. Results were presented as tables.

RESULTS

A total of 128 medical records meeting the inclusion criteria were analyzed among the 624 operated patients during the study period (20.51%).

Sociodemographic characteristics

Table 1: Socio-demographic characteristics

Parameters	Frequency (N=128)	Percentage
Age (years)		
<25	6	4.69
25-50 excluded	62	48.44
50-75 excluded	55	42.97
75≥	5	3.91
Sex		
Female	52	40.63
Male	76	59.38
Occupation		
Artisan/Manual labourers	45	35.16
Civil servant	28	21.87
Trader/Reseller	25	19.53
Residence		
Rural	22	17.19
Urban	106	82.81
Religion		
Animist	3	2.34
Christian	106	82.81
Muslim	19	14.85
Education level		
No formal education	31	24.22
Primary	25	19.53
Secondary	30	23.44
Higher education	42	32.81

Clinical characteristics

Table 2: **Clinical characteristics**

Parameters	Frequency (N=128)	Percentages
Chief complaint		
Abdominal pain	37	28.19
Swelling	65	50.78
Abdominal pain + Swelling	26	20.31

Parameters	Frequency (N=128)	Percentages
Mode of admission		
Admitted through the emergency ward	86	67.19
Outpatient clinic	35	27.34
Referral	7	5.47
Timing of admission		
<6 hours	105	82.03
[6 – 12 [hours	6	4.69
[12 – 24 [hours	11	8.59
≥ 24 hours	6	4.69
Medical history		
Surgical	2	1.56%
Medical		
High blood pressure	32	25.00%
Type 2 diabetes	1	0.78%
Physical signs (Lump)		
Right inguinal lump	22	24.17
Right inguino-scrotal lump	20	21.98
Left inguinal lump	14	15.38
Lump characteristics		
Painful	73	61.38
Expansile	103	80.69
Reducible	93	77.93
Impulsive	102	81.38
Functional signs		
Nausea	68	53.12
Vomiting	62	48.44
None	55	42.97
Clinical diagnoses		
Right inguinal hernia	23	17.96
Line alba hernia	16	12.5
Left inguinal hernia	12	9.37

Paraclinical characteristics

Table 3: **Paraclinical characteristics**

Parameters	Frequency (N=128)	Percentage
Laboratory test		
Complete blood count		
Leukocytes		
Normal	118	92.19%
Hyperleukocytosis	10	7.81 %
Hemoglobin		
Normal	119	92.97%
Anemia	7	5.47 %
Imaging		
Plain abdominal X-ray	6	4.68%
Abdominal ultrasound	16	12.5%
CT scan	3	2.34%

Therapeutic management

Table 4: **Therapeutic management**

Parameters	Frequency (N=128)	Percentage
Type of anaesthesia		
General anaesthesia	75	58.59
General anaesthesia + sedation	1	0.78
Spinal anaesthesia	52	40.63
Surgical procedures		
Mesh repair	98	76.56
Tissue repair (Herniorrhaphy)	30	23.44

Clinical outcome

Postoperative recovery was uncomplicated in 96.88% of patients.

Complications consisted of postoperative peritonitis (0.78%) and surgical site infection (1.56%). There was one postoperative death (0.78%).

DISCUSSION

Sociodemographic features

During our study period from January 1, 2022 to December 31, 2024, we identified 128 patients who underwent surgery for abdominal wall disorders, representing a frequency of (20.51%). This prevalence of abdominal wall surgical pathologies in our study aligns with findings from several African countries. Thus, Adesanya and al reported a prevalence of 23.1% [13], Diallo M. and al at Donka University Hospital in Conakry reported 20.6% [18] and Dossouvi T. and Konate M. and al in Bamako reported 25.4% [15].

Our results remain higher than those reported in high-income countries, notably by Cobb WS and al in the United States, who reported that approximately 10-12% of patients underwent surgery for abdominal wall pathologies [9]. Whereas in Europe, the HerniaSurge Group reported rates ranging from 8% to 14% depending on the country and hospital [24]. These differences may be explained by the high prevalence of risk factors observed in African countries such as frequent heavy lifting, chronic malnutrition, chronic constipation, a a history of fragile surgical scars, multiparity and a higher proportion of emergency surgical procedures [14,16,21,22].

The mean age of our patients was 48.27 ± 15.93 years. This finding is comparable to the results reported by Ouattara in Burkina Faso [13], Bangoura in Guinea [17], and Chichom in Cameroon [22], who reported mean ages of 46, 43, and 40 years respectively. In contrast, higher mean ages were reported by Traoré in Mali [21], Bittner in Germany [33], and Fitzgibbons in the United States [26], with mean ages of 51, 59, and 57 years respectively.

These differences indicate that the majority of African studies report a mean age between 40 and 55 years, corresponding to the period of intense professional activity. This phase of life is characterised by repeated physical exertion and, in by the occurrence of prostatic disorders in men.

Male patients were predominant in our series, accounting for 59.38% of cases (sex ratio = 1.46). This male predominance has been widely reported in the literature: Hassan in Egypt reported 63% [32], Ouarssani in Morocco 68% [31], Takongmo in Cameroon 71% [22], Kouamé in Côte d'Ivoire 75% [20], Simons *et al.* reported 71% male patients in a large European series [25], and Kingsnorth reported 68% in the United Kingdom [32].

From an anatomical perspective, this male predominance can be explained by the presence of the inguinal canal (true area of weakness through which the spermatic cord passes) thereby predisposing men to the development of groin hernias [24]. From a socio-occupational aspect, physically demanding tasks are still predominantly performed by men in our settings, resulting in greater exposure to repeated increases in intra-abdominal pressure.

Artisans and manual workers constituted the most represented socio-occupational category in our study (35.16%), followed by civil servants (21.87%) and traders/resellers (19.53%). A similar predominance was reported by Ngowe *and al.* in Cameroon, where 47% of patients were manual workers [35], by Ohene-Yeboah in Ghana, who reported 52.3% of artisans and manual labourers [8], and by Kidanu *and al.* in Ethiopia, where 54% of patients were engaged in occupations requiring intense physical exertion [37].

In our study, the majority of patients resided in urban areas (82.81%), while only 17.19% came from rural areas. This is comparable to that reported by Fall *and al.* in Senegal (78%) [29], Mahamat *and al.* in Chad (73%) [8], and Parker *and al.* in Kenya (69%) [23]. However, studies conducted in more peripheral regions report a different pattern: in Tanzania, Mshana *and al.* found that 56% of patients originated from rural areas [27], highlighting the variability of patient profiles according to the location of the hospital. In our context, the high proportion of urban patients can be explained by the geographical location of CHUZ Suru-Lere, situated in a densely populated urban area and serving as a primary referral hospital.

Christianity was the predominant religion (82.81%), followed by Islam (14.85%). This finding is comparable to those reported by Ohene-Yeboah *and al.* in Ghana, with 75% Christians and 23% Muslims [8], Ngowe *and al.* in Cameroon, with 78% Christians [23], and Masesa *and al.* in Tanzania, with 81% Christians [27]. The observed predominance of Christianity in our series therefore primarily reflects the sociocultural composition of the population served by CHUZ Suru-Lere, rather than any specific religious predisposition.

Higher education was the most represented level of education (32.81%), followed by secondary education (23.44%), no formal education (24.22%), and primary education (19.53%). These proportions are comparable to those reported by Kuubiere *and al.* in Ghana, with 30% of patients having secondary education and 28% having higher education [28], and by Ndege *and al.* in Kenya, who found that 56% of patients had either secondary or higher education [30]. These trends can be explained by the fact that more educated

individuals predominantly reside in urban areas, have better access to health information, possess a relative financial autonomy, and tend to seek care at referral centres more promptly.

Clinical features

The most frequent reason for consultation was parietal swelling (50.78%), followed by isolated abdominal pain (28.91%) and the combination of pain with swelling (20.31%). This symptomatic profile is very similar to that reported by Kuubiere *and al.* in Ghana (53%) [28], Ba *and al.* in Senegal (48–55%) [39], and Masesa *and al.* in Tanzania (51%) [27]. The majority of patients were admitted directly through the emergency ward (67.19%). A similar predominance has been reported by Bello *and al.* in Niger, with 64% admitted via emergency [38], and by Amegbor *and al.* in Togo, with 62% and 70% direct admissions depending on the year [36]. This admission profile reflects the typical functioning of urban district hospitals which are high accessibility for patients, a substantial proportion of direct admissions, and a less central role for the referral system.

In our study, 82.03% of patients were admitted within the first six hours following symptom onset. This timing is comparable to that reported by Ba *and al.* in Senegal, where 75–81% of patients with strangulated hernias in urban areas sought care within the first hours of symptom onset [39]; by Kuubiere *and al.* in Ghana, with nearly 80% admitted within 12 hours [28]; and by Amegbor *and al.* in Togo, where 78% of patients consulted within the first 12 hours [36]. In contrast, our results differ from those observed in rural or semi-rural settings. In Nigeria, Mbah *and al.* reported that more than 50% of patients sought care after 24 hours [17], and in Mali, Fofana *and al.* found that the majority of patients undergoing surgery for incisional hernia presented late, after more than 24 hours of onset[21].

Surgical history was rare in our study (1.38%), whereas the most frequent medical histories were high blood pressure (25.00%) and, to a lesser extent, diabetes (0.69%). Similar findings have been reported by Dossouvi *and al.* in Benin, with 2–3% of patients undergoing hernia surgery having a history of abdominal surgery [19], by Ohene-Yeboah in Ghana, with 3% [31], and by Amegbor *and al.* in Togo, with 20–25% of patients presenting with high blood pressure [14], as well as by Cissé *and al.* in Senegal, with 18% [16].

In our serie, 28.91% of patients consulted for isolated abdominal pain, while 20.31% presented with pain associated with a lump. These findings are consistent with those reported by Cissé *and al.* in Senegal (30%) [16], Ohene-Yeboah in Ghana (27%) [31], Bello *and al.* in Niger (29%) [38], and Amegbor *and al.* in Togo (18–22%) [14]. The other most frequently reported digestive symptoms were nausea (53.12%) and vomiting (48.44%), followed by diarrhoea (7.03%), constipation (3.91%), and cessation of stool and gas (3.91%). These results are comparable to those reported by Cissé *and al.* in Senegal, with nausea in 50% of cases and vomiting in 45% [16]; Kuubiere *and al.* in Ghana, with 52% experiencing nausea and 47% vomiting [28]; Masesa *and al.* in Tanzania, with 46% vomiting [27]; Amegbor *and al.* in Togo, who reported 3–6% of cases with cessation of stool and gas [14]; and Diallo *et al.* in Guinea, with 4% [18].

Lump was the predominant physical sign and the main reason for consultation in 50.78% of cases. This proportion is comparable to those reported by Amegbor *and al.* in Togo (52%) [14], Diallo *et al.* in Guinea (49%) [18], and Kuubiere *et al.* in Ghana (53%) [28].

The lump was primarily located in the right inguinal region (24.17%) and the right inguino-scrotal region (21.98%). A similar right-sided predominance was reported by Ohene-Yeboah in Ghana in over 60% of cases [31], Diop *and al.* in Senegal (64%) [53], and Masesa *and al.* in Tanzania (58%) [27]. The right-sided predominance may be explained by anatomical factors, such as later descent of the right testis or asymmetry of the abdominal wall structures.

The lump was impulsive in 81.38% of cases, expansive in 80.69%, reducible in 77.93%, and painful in 61.38% of cases. These proportions are consistent with the classical characteristics of uncomplicated hernias described in literature. In Senegal, Cissé *and al.* reported that 83% of cases were impulsive, and reducible in 78% [16]. In Togo, Amegbor *and al.* observed expansivity in 75–81% of cases depending on the series [14]. In Ethiopia, Kidanu *and al.* reported reducibility in 79% of groin hernias [37], while Diallo *and al.* in Guinea noted that 58% of patients presented with a painful mass [18].

Clinical diagnoses in our study were dominated by right inguinal hernias, representing 23.47% of patients, followed by hernias of the linea alba, left inguinal hernias, and umbilical hernias, accounting for 16.33%, 12.24%, and 11.22%, respectively. A similar predominance has been reported by Adesanya *and al.* in Nigeria, where 68.4% of operated abdominal wall pathologies were inguinal hernias [13]; by Ohene-Yeboah and Abantanga in Ghana, with inguinal hernias constituting 72% of operated cases [31]; and by Konaté *and al.* in Mali, who observed that inguinal hernias represented 55.1% of operated abdominal wall pathologies [15]. Thus, the intraoperative distribution observed in our study is characterised by a predominance of inguinal hernias, a variable proportion of umbilical and linea alba hernias, and a moderate frequency of complicated cases, depending on the healthcare and sociocultural context of each country.

Therapeutic management

Mesh repair was performed in 76.56% of cases, compared with 23.44% of herniorrhaphy. A

predominance of mesh repair has also been reported by Amegbor *and al.* in Togo, with 71.4% [11]; Mensah *and al.* in Ghana, 78% [12]; Konaté *and al.* in Mali, 64% [20]; and Cissé *and al.* in Senegal, 69.5% [10]. Dossouvi *and al.* in Benin reported a herniorrhaphy rate of 31%, primarily for small hernias and cases of strangulation [19].

General anaesthesia was the most common in our serie (58.59%), followed by spinal anaesthesia (40.63%). This anaesthetic profile is consistent with practices reported by Mbah *and al.* in Nigeria, with 61% of cases under general anaesthesia [17], as well as with data from Togo, where spinal anaesthesia is also widely used for inguinal hernia repairs [14]. Finally, the inguinal approach was predominantly used in our study. This aligns with observations from Guinea, where Diallo *and al.* also reported a clear predominance of conventional open surgery for the treatment of complicated hernias [18]. This contrasts with referral centres in Ghana and Nigeria, where laparoscopic approaches, including TEP and TAPP, are increasingly used [12].

Overall, the therapeutic practices observed in our study are consistent with those reported in several African countries, highlighting the widespread use of prosthetic techniques, the predominance of open approaches, and the predominant use of general anaesthesia. This consistency reflects a regional convergence in the management of abdominal wall pathologies.

Outcomes

Postoperative outcomes were predominantly favourable in 96.88% of cases. Two types of complications were recorded: postoperative peritonitis and wound infection, representing 0.78% and 1.56% respectively. One death was recorded, corresponding to a mortality rate of 0.78%.

These results are comparable to those reported by Cissé and al. in Senegal, with an early postoperative complication rate of 3.5%, predominantly wound infections [34]. In another Senegalese study conducted in Dakar, wound infections accounted for 4.8% of immediate postoperative outcomes, with a postoperative mortality rate of 1.2% [10].

In Togo, Amegbor and al. observed an early postoperative complication rate of 5.2%, mainly wound infections (4.1%) [11].

The postoperative mortality rate observed in our study was 0.78%, comparable to that reported in Guinea by Diallo *and al.*, who noted a mortality rate of 1%, primarily associated with strangulated hernias [18]. In Malian series, mortality ranged from 2 to 3%, often influenced by the patients' compromised general condition at the time of admission [20].

Conclusion

Surgical abdominal wall pathologies in adults represent a significant proportion of the surgical workload at CHUZ Suru Lere. Their management relies primarily on clinical examination, mesh repair when indicated, and close postoperative monitoring. Although overall outcomes are satisfactory, upgrading technical infrastructure, improving access to imaging, and increasing public awareness could further optimise early diagnosis and prognosis.

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