

Inguinal Hernia in Adults: Diagnostic and Therapeutic Aspects at Cs Ref CI Bamako Mali

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Abstract

The inguinal hernia is a very frequent surgical pathology in the world and it represents 95% of the hernias of the groin. This work aimed to determine the frequency of inguinal hernias, describe the clinical and therapeutic aspects of inguinal hernias, describe the morbidity and mortality related to inguinal hernias and evaluate the cost of treatment. Our study was conducted from January 2010 to December 2010 in the general surgery department of the Reference Health Center of Commune I in the district of Bamako. We collected 130 cases of inguinal hernias with a sex ratio of 15.25 in favor of the male sex. The mean age was 48.02 years (standard deviation: 17.53 years). Strangulated inguinal hernias accounted for 4.9% of abdominal surgical emergencies and 14.6% of all operated inguinal hernias. More than half of the patients (82%) were operated under local anesthesia. Clinical signs were marked by painless or irreducibly painful inguinal swelling. The diagnosis was clinical in all patients. Some patients benefited from a minimum blood assessment (rhesus grouping, glycaemia, hemoglobin level and hematocrit). The Shouldice technique was performed in 68% of patients. One case of organ resection was performed, *i.e.* 0.8% of cases. Morbidity was 4.6% due to wall abscess; 0.8% scrotal hematoma type. We have not recorded any recurrence or death.

Keywords

Inguinal, Hernias, Surgery, Cs Ref, CI, Bamako (Mali)

1. Introduction

Inguinal hernia is the spontaneous or progressive, temporary or permanent pas-

sage of viscera or part of viscera out of the cavity normally containing it. This passage is made through an anatomically preformed area of weakness of the inguinal canal [1]. Inguinal hernia is a very frequent surgical pathology in the world and it represents 95% of groin hernias [2]:

In the USA and Europe: more than one million inguinal hernias repaired annually. Incidence: 28 cases per 100,000 inhabitants, out of a prevalence of 24% of interventions [3].

In England: Cure of inguinal hernia: 10 cases per 100,000 inhabitants with more than 80,000 operations performed per year [4].

In Africa: about 4.6% of the population [5].

In Central Africa: adult prevalence was 25% [6].

In Egypt: inguinal hernia: 56% out of 2516 abdominal hernia repairs [7].

In Senegal from January 1994 to June 2000, 538 children aged between 15 days and 15 years operated on for an inguinal hernia, *i.e.* 86.08% of the 625 patients operated on for groin hernias [8].

In Côte d'Ivoire, between 1993 and 2003 inguinal hernias: 18% in the pediatric surgery department; the technique used is that of Forgues [9].

In Mali: 5.98% of patients hospitalized in Bamako hospitals [10]; CHUs (Point G, Gabriel Touré Kati) according to Dembélé IB: 10.5% of all surgical procedures; Koumaré AK: 43.5% of surgical acts in the first region between 1986 and 1987 and 56.2% in the 2nd region between 1984 and 1988. The techniques used in these two regions are: that of Bassini and Forgues [3].

However, given the multiplicity of techniques and qualified surgeons, the hernia poses a public health problem. Despite the frequency and severity associated with this pathology, no study has been conducted at the reference health center of Commune I of Bamako in Mali.

2. Method and Patients

This work was carried out in the Reference Health Center of Commune I of the District of Bamako.

This was a prospective cross-sectional study from January 1, 2010 to December 31, 2010 in which all patients underwent a general clinical examination. Complications were sought at the patient's bedside during the period of hospitalization for strangulated hernias and one month on an outpatient basis. We identified 130 patients who met the criteria:

*Inclusion: Any patient having consulted in the general surgery department of the Cs Ref of Commune I of the district of Bamako for inguinal hernia, whose diagnosis has been confirmed and taken care of.

*Not included: Any inguinal hernia not operated on in the department; complicated hernias with risk of necrosis and inguinal hernia in children.

The variables studied were socio-demographic (age, sex, profession, residence); physical examination (general, functional, physical signs); additional examinations (ultrasound, biological assessment: NFS, Rhesus Group, TP TCK, Glycemia

and Creatinemia) and surgical treatment: technique and postoperative course.

The supports used were the medical files of the patients, the registers of external consultation, hospitalization, consigning the reports of the patients, the form of individual investigation and protocol of anesthesia.

Data entry and analysis were performed using Epi-info version 6.5 software; word processing on SPSS software version 17 and Microsoft Word 2010. The comparison tests used are Chi² and P < 0.05.

3. Results

Our cross-sectional prospective study from January 2010 to December 2010 allowed a collection of 130 inguinal hernias including 19 cases of strangulation. We performed 1602 surgical consultations; 385 surgeries and 1070 hospitalizations. Inguinal hernia represented 8.11% of consultations; 33.8% of surgical interventions and 2.71% of hospitalizations (29/1070). The average age was 48.02 years with extremes: 16 years and 95 years and Deviation-standard 17.53 years). The sex ratio was 15.25 in favor of the male sex.

Farmers/workers were the most represented, *i.e.* 62.3% of cases; 75.4% of patients resided in Bamako and/or Koulikoro, of which 47.7 in Bamako and 46% of patients were referred by health personnel and 85% seen in ordinary consultation. More than half of the patients consulted for inguinal swelling (62.3% of cases). Physical effort was the most favoring factor at 68.5%. Awareness of hernial disease was observed in 83.1% of patients. The risk of strangulation was unknown in 66.9% of cases and 14.6% of hernias were complicated.

The average duration of evolution of the hernia was 3.2 years; the extremes: 1 month and 30 years and one standard deviation = 4.9 years (62.3% of patients at most 5 years). A surgical history was observed in 36.2% of cases; 3% of medical history and 75% of women were multiparous. More than half of the hernias were on the right, *i.e.* 64% of cases.

The size of the hernial sac (6 and 10 cm) was 52.3% of cases. The average size of the hernia sac was 7.8 cm; Standard deviation = 6.7 cm and the extremes 2 cm and 30 cm. 75% of inguinal hernias were indirect with 14 cases of old recurrences and 82.2% of hernial sacs contained hail. Local anesthesia was performed in 82% of cases. The Shouldice technique was the most practiced in 68% of cases. The average duration was 55 minutes with the extremes 42 minutes and 90 minutes and a standard deviation of 8.8 minutes. The follow-up was simple in 85.4% of cases and 19 patients presented a postoperative complication, *i.e.* 14.6% of cases. The average cost of care was 32,850 CFA francs; the extremes: 21,500 and 57,000 CFA francs.

4. Comments and Discussion

Inguinal hernia is the most frequent surgical pathology in Mali [11]. In our study, the first place is 33.8% of surgical procedures; of authors reported [1] [12] [13] this predominance in general surgery. In our study, strangulated hernias

(14.6%) represented the fourth place of abdominal surgical emergencies, the second place according to Sagara A. (18.9%) [11]; the third according to Sissoko M.S. (15.58%) [13]; fourth place according to SANGARE B. [14] at CHU Gabriel Touré and Muynk [15], second place for abdominal surgical emergencies.

Inguinal hernia is pathology in young adults, as evidenced by numerous studies [4] [6] [16]. Our average age was 44.85; DEMBELE IB [4], 42.6 years old and BARRAT C. [14], 47.4 years old; Harouna Y. *et al.* [12]; the average age (32 years) lower than ours, explained by the upper age limit (67 years) also lower than ours (95 years). This average age is close to that reported by European studies; 50 to 60 years old [11] [12] [13]. Gender is a risk factor in relation to the profession and the effort made. In several studies the male sex was the most represented. Thus Barrat C. in France; Sangaré B. in Mali and Harouna Y. in Niger found a higher frequency of hernia disease in men [10] [12]. Our sex ratio (15.25) is comparable to those in the literature [1] [6] [9].

In our study, 62.3% of our patients were peasants and/or workers. Their large number would be explained by the favoring role of the repeated intense physical effort characterizing these two activities; Sangare B. [14], (65.2%) and Harouna Y. [12], (44.4%). These results corroborate ours. The mean evolutionary duration of the inguinal hernia was 5.7 years [11] [13] and 3.2 years compared to only 14.6% of cases having their hernia in less than a year in our series as in those of Sagara A. [11] (13.4%); by Sangare B. [14] (19.6%). Intra-abdominal hypertension (cough, pregnancy and dysuria) is recognized in the pathogenesis of inguinal hernia [16]. Physical effort has been the most represented factor of abdominal hyperpressure in the literature [1] [6] [7] as in our series.

In our study, the hernia predominated on the right in 63.8% of cases, as in the literature [11] [14]. The predominance of the right side of the inguinal hernia would be linked, according to the literature, to late obliteration of the right peritoneal-vaginal canal; the larger small intestine mass on the right and the high position of the right testicle compared to the left testicle [9].

The most frequently associated pathologies are hypertension, diabetes and asthma [14] and in our series: hypertension (6.2%), diabetes (1.5%), asthma (1.5%) and testicular tumor (0.8%). The mean duration of hernia strangulation in the studies carried out in Mali was 31 to 32 hours [13] [14]; our study (4.6 hours) and cases susceptible to visceral necrosis were excluded (absence of intensive care unit). We used the Shouldice technique (68%), followed by Bassini (26%) and Mac Vay (6%). The Shouldice technique was the reference procedure due to the recurrence rate of less than 1% according to data in the literature [1] [4] [5] [8].

Complications are rare: hematoma, parietal infection (less than 1%), persistent pain for a few weeks or months (about 1%) [4]. Our series was comparable to that of SANGARE B. (63.1%) by the Shouldice technique; SAGARA A., [11], (100%) by the Bassini technique. Only one controlled study concluded the effectiveness of modified Bassini 2.3% of recurrences on Shouldice (4.6%) of recurrences. Chester B. Mc Vay found a recurrence rate of 5% for direct hernias (n =

180), 4% for mixed hernias (n = 49) and 2% for indirect hernias (n = 179) with a lost percentage of view of 9% in a 22-year experience [4].

We used two types of anesthesia: local (82.3%) and general (17.7%); 2% xylocaine without any inconvenience, easy and practical as demonstrated by other authors [2] [11]. Only elective inguinal cures are feasible under local anesthesia; its advantages appear numerous, responding to concerns of safety, simplicity, comfort and economy. However, it is insufficient for performing the surgical act in the context of an emergency [15]. General anesthesia has been used in strangulated inguinal hernias, large inguino-scrotal hernias, and patient choice.

Other authors, [11] [15] [16] respectively used general and loco-regional anesthesia in strangulated hernias. This difference in anesthesia techniques used by these different authors compared to our study could be explained by the choice of anesthesiologists, the non-mastery of gestures and/or the non-availability of equipment for loco-regional anesthesia.

Abscesses of the wall and hematomas are the most reported immediate sequels [11] [14]. The immediate consequences were marked by abscesses of the wall (4.6%), hematomas (0.8%). Sissoko M.S. [13] found 30.54% (abscess of the wall = 5.56%, hematoma = 13.87% and delayed healing = 11.11%).

Complications and mortality from emergency surgery for strangulated inguinal hernia are higher than those from cold surgery and would depend on the duration of evolution of the strangulation, the existence or not of digestive necrosis, age and physiological state of the patient [11]. Authors: Sissoko M.S. [13]; Harouna Y. [12]; Sagara A. [11] respectively reported a postoperative mortality rate of: 2.79%; 40%; 1.9% and 25.9%. The mortality rate was zero in our series as in Sangare B.

Our average cost of care was 32,850 F and the extremes between 21,500 F and 57,000 F CFA. The cost of the management of complicated hernia is much higher than the Malian SMIG equal to 28,460 CFA francs. The cost is increased by the occurrence of complications.

5. Conclusion

Inguinal hernia, frequent in our practice; the application of aseptic measures makes it possible to reduce postoperative morbidity. Early diagnosis and rapid treatment can prevent complications. Our study, selective excluding children and complications with risk of necrosis must be completed by other studies including all patients for a clear prevalence of inguinal hernia in the Cs Ref CI Bamako Mali.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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Annex

The age group of 46 to 60 years was the most represented, *i.e.* 34.6% (Average age = 48.02 years; Extreme ages: 16 years and 95 years and Deviation-standard 17.53 years). The sex ratio was 15.25 in favor of the male sex. 62.3% were peasants/workers.

75.4% of patients resided in Bamako and/or Koulikoro, including 47.7 in Bamako (**Table A1**).

46% of patients were referred by health personnel and 85% seen in ordinary consultation (**Table A2**).

62.30% of patients consulted for inguinal swelling and observed on physical examination. 27.70 of the hernias were accompanied by pain. 76.20% of the hernias were reducible spontaneously, at rest in the supine position (**Table A3**).

83.1% of patients knew about hernia disease. The risk of strangulation was unknown in 66.9% of cases. 14.6% of hernias were complicated by strangulation. 85.4% of patients had been living with their inguinal hernia for over a year (**Table A4**).

Table A1. Socio-demographic characteristics.

Sociodemographic characteristics		Number	Percentage
Age	15 - 30	25	19.2
	31 - 45	32	24.6
	46 - 60	45	34.6
	Others	28	21.6
Sex	Male	122	94
	Feminine	8	6
Occupation	Peasant/Worker	81	62.3
	Pupil/Student	18	13.8
	Others	31	23.8
Origin	Bamako/Koulikoro	98	75.4
	Others	32	24.6

Table A2. Distribution of patients according to recruitment method.

Method of recruitment		Number	Percentage
Referred or not	came by itself	70	54
	Male nurse	20	15
	Doctor	40	31
Consulting	Emergency room	20	15
	Ordinary consultations	110	85
Total		130	100

Table A3. Distribution of patients according to reason for consultation and physical signs.

Reasons for consultation and physical signs		Number	Frequency
Reasons for consultation	Abdominal pain	8	6.20
	Inguinal pain	5	3.80
	Inguino-scrotal swelling + inguinal pain	12	9.20
	Inguinal pain + inguinal swelling	14	10.80
	Inguino-scrotal swelling	10	7.70
	Inguinal swelling	81	62.30
physical signs	Inguinal swelling + pain	36	27.70
	Inguino-scrotal swelling	13	10
	Inguinal swelling	81	62.30
Supine rest		99	76.20
Reducibility factors	Manual	12	9.20
	Not reducible	19	14.60
Total		130	100

Table A4. Distribution of patients according to knowledge, the risk of strangulation, the rate of strangulation and the evolutionary duration of the hernial disease.

Knowledge		Number	Percentage
Inguinal hernia	Yes	108	83.1
	No	22	16.9
Risks	Yes	43	33.1
	No	87	66.9
Strangulation	Yes	19	14.6
	No	111	85.4
Duration of evolution of the hernia	Less than a year	19	14.6
	1 - 5 years	62	47.7
	6 years and over	49	37.7

83.10% of the patients knew the hernia disease. The risk of strangulation was unknown in 66.90% of cases. 62.3% of patients had a hernia for at most 5 years. The average duration of evolution of the hernia was 3.2 years; the extremes: 1 month and 30 years and one standard deviation = 4.9 years. 14.60% of hernias were complicated by strangulation (**Table A5**).

82% of patients were operated under local anesthesia. 64% of hernias were on the right side. The Shouldice technique was the most practiced in 68% of cases. The operative time was less than one hour or 83.80% of cases with the extremes 42 minutes and 90 minutes. The average duration was 55 minutes and a standard deviation of 8.8 minutes.

85.40% of patients presented a simple postoperative course and 19 patients presented a postoperative complication, i.e. 14.60% of cases. 4% of patients had residual pain in the late follow-up at 3 months (**Table A6**).

Table A5. Distribution according to knowledge of hernia.

Knowledge of hernia.		Number	Frequency
Knowledge of hernia	Yes	108	83.10
	No	22	16.90
Knowledge of risks	Aware of the risk	43	33.10
	Not Aware of the risk	87	66.90
Evolutionary duration of the hernia	Less than a year	19	14.60
	1 - 5 years	62	47.70
	6 - 10 years	33	25.40
	Over 11 years old	16	12.30
Complication (Strangulation)	Yes	19	14.60
	No	111	85.40
Total		130	100

Table A6. Support and post-operative follow-up.

Treatment and post-operative care		Number	Frequency
Type of anesthesia	Local	107	82
	General	23	18
Surgical technique	Shouldice	88	68
	Bassini	34	26
	MacVay	8	6
Operative time	0 to 60 mins	109	83.80
	60 mins or more	21	16.20
Postoperative complications	Yes	19	14.60
	No	111	85.40
Duration of hospitalization	1 day	17	13
	2 days	1	0.80
	7 days	1	0.80
Ambulatory	Ambulatory	111	85.40
	Simple suites	111	85.40
Immediate post-operative follow-up	Residual pain	8	6.20
	parietal abscess	6	4.60
	Hematoma	1	0.80
	Healing delay	4	3.10
	Simple suites	115	88
Late postoperative follow-up at 3 months	Residual pain	5	4
	Lost	10	8
Total		130	100

Table A7. Cost of treatment.

Cost of treatment in FCFA	Number	Percentage
Less than 25,000 FCFA	69	53.1
25,000 to 45,000 FCFA	22	16.9
More than 45,000 FCFA	39	30
Total	130	100

53.1% of patients were covered at less than 25,000 CFA francs. The average cost of care was 32,850 CFA francs; the extremes: 21,500 and 57,000 CFA francs (**Table A7**).