

# Inguinodynia and inguinal hernia recurrence amongst Ugandan patients who underwent mesh versus non-mesh inguinal hernia repair

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## Abstract

**Introduction:** The prevalence of inguinal hernia recurrence dropped tremendously with the advent of mesh hernioplasty. However, the prevalence of inguinodynia has increased.

**Objective:** To determine and compare the prevalence of chronic postoperative inguinal pain (inguinodynia) and recurrence amongst patients who underwent mesh versus no mesh inguinal hernia repair in St. Francis Hospitals Nsambya and Naggalama in Uganda.

**Method:** This was a cohort retrospective study conducted at St Francis Hospitals Nsambya and Naggalama. The sample size was two hundred and two patients. A consecutive sampling technique with replacement of missing charts was used. The Principal Investigator and the research assistants then made telephone calls to the patients inviting them for an interview in the two hospitals, and for those who could not attend questionnaires were administered to them on phone. This was done sequentially until the sample size for each hospital was reached. If a given telephone was not available or went unanswered, we telephoned the next patient in the sequence on the register. Inguinodynia was assessed using the Numerical Rating Pain Score (NPS). Recurrence was assessed by physical examination.

**Results:** Two hundred and two patients were enrolled in the study. The prevalence of chronic postoperative inguinal pain amongst patients who underwent mesh versus non-mesh inguinal hernia repair were 24.4% and 8.5% respectively and the recurrence rates were 3.1% and 4.2% respectively.

**Conclusion:** The prevalence of chronic postoperative pain amongst patients who underwent hernioplasty was higher than those who underwent non-mesh inguinal hernia repair. There was statistically no difference in recurrence rates between patients who underwent mesh versus non-mesh inguinal hernia repair in both hospitals.

**Key words:** chronic postoperative inguinal pain, inguinodynia, hernioplasty, and numerical rating pain score

## Introduction

Hernia surgery is one of the most common surgical operations done worldwide. <sup>[1]</sup> Globally, about 20 million groin hernia surgeries are done each year. <sup>[2]</sup> Inguinal hernia surgery is associated with complications such as inguinodynia and recurrences. The rate of chronic postoperative inguinal pain after inguinal hernioplasty has been reported at 51.6% <sup>[3]</sup> and 53%. <sup>[4]</sup> Chronic postoperative inguinal pain is a common and dreaded complication after inguinal hernia. Inguinal hernia recurrence is a clinically detectable hernia in the site where inguinal hernia was repaired and this hernia is detected either immediately or later after surgery. <sup>[5]</sup> Recurrence rate in mesh inguinal hernia repair is less than in non-mesh inguinal hernia repair. <sup>[6]</sup>

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## Method

This was a cohort retrospective study conducted at St Francis Hospitals Nsambya and Naggalama from October 2017 to February 2018. All patients who underwent mesh or non-mesh inguinal hernia repair were included.

The formula used to estimate the study size was obtained from Essentials of Medical Statistics. The minimum sample size calculated was 200 patients with the ratio of cases from Naggalama and Nsambya being 2:1.

Data were collected from consecutive patients' records with replacement of missing charts. The hernia registers were reviewed and a list of names compiled for the retrieval

of the records. The telephone contacts were obtained from these records and calls made to the patients until the sample size was obtained.

Data were captured in a database designed in Microsoft Access, 2016 and transferred for cleaning and statistical analysis in STATA version 14.0 (StataCorp, College Station, TX, USA).

Approval from Institutional Research and Ethics Committee was obtained from both hospitals.

## Results

The average age was 47.7 (SD=16.4) years, about a quarter were aged 61 years or more; 86.1% were males, and 68.8% were labourers or farmers. Table 1.

Table 2 shows that the prevalence of chronic postoperative inguinal pain amongst patients who underwent mesh hernioplasty was 24.4% while amongst patients who underwent non-mesh inguinal hernia repair it was 8.5%. The prevalence of recurrence of inguinal hernia amongst patients who underwent mesh inguinal hernioplasty was 3.1% while amongst patients who underwent non-mesh inguinal hernia repair it was 4.2%. The prevalence of chronic post-operative inguinal pain amongst patients who underwent mesh versus non-mesh inguinal hernia repairs was statistically significant ( $p=0.006$ ). The prevalence of the recurrence rate of inguinal hernia amongst patients who underwent mesh versus non-mesh inguinal hernia repairs was not statistically significant,  $p=0.664$ .

There were no statistically significant relationships between the chronic post-operative inguinal pain and patient characteristics in the patients who underwent mesh hernioplasty (all  $p$ -values  $>0.05$ ). Similar results of no relationship were observed in the patients who underwent non-mesh inguinal herniorrhaphy. See Table 3.

In Table 4 and at bivariate analysis, only hernia type

**Table 1. Demographics of patients who underwent inguinal hernia surgery**

Characteristics	n (%)
<b>Sex</b>	
Female	28 (13.9)
Male	174 (86.1)
<b>Age (years)</b>	
19-30	40 (19.8)
31-40	34 (16.8)
41-50	43 (21.3)
51-60	34 (16.8)
61+	51 (25.3)
<b>Occupation</b>	
Labourers and farmers	139 (68.8)
Civil servants	22 (10.9)
Motor cycle riders	24 (11.9)
Other	17 (8.4)

**Table 2. Prevalence of inguinodynia and inguinal hernia recurrence**

Variable	Response			P-value
	Yes n (%)	No n (%)	Total n (%)	
<b>Chronic post-operative inguinal pain</b>				
Mesh repair	32 (24.4)	99(75.6)	131(100.0)	
Non-mesh repair	6 (8.5)	65(91.5)	71(100.0)	
<b>Total</b>	38	164	202	0.006*
<b>Recurrence of inguinal hernia</b>				
Mesh repair	4 (3.1)	127(96.9)		
Non-mesh repair	3 (4.2)	68 (95.8)		
<b>Total</b>	7	195	202	0.664

\*P-value ( $<0.05$ ) considered as statistically significant

**Table 3. Recurrence rate of inguinal hernia-by-hernia type and patient characteristics**

Patient characteristics	Mesh			Non mesh		
	Recurrence	No recurrence	p-value	Recurrence	No recurrence	p-value
<b>Gender</b>	<b>n (%)</b>	<b>n (%)</b>		<b>n (%)</b>	<b>n (%)</b>	
Female	0 (0.0)	24 (18.9)	1.000	0 (0.0)	4 (5.9)	1.000
Male	4 (100)	103 (81.1)		3 (100)	64 (94.1)	
<b>Age group (years)</b>						
19-30	1 (25.0)	13 (10.2)	0.649	1 (33.3)	25 (36.8)	1.000
31-40	0 (0.0)	17 (13.4)		1 (33.3)	16 (23.5)	
41-50	1 (25.0)	36 (28.3)		0 (0.0)	6 (8.8)	
51-60	0 (0.0)	26 (20.5)		0 (0.0)	8 (11.8)	
61+	2 (50.0)	35 (27.6)		1 (33.3)	13 (19.1)	
<b>Occupation</b>						
Labourers and farmers	2 (50.0)	109 (85.9)	0.110	1 (33.3)	27 (39.7)	1.000
Civil servants	1 (25.0)	5 (3.9)		1 (33.3)	15 (22.1)	
Motor cycle riders	1 (25.0)	7 (5.5)		1 (33.3)	15 (22.1)	
Other	0 (0.0)	6 (4.7)		0 (0.0)	11 (16.1)	

(non-mesh) was statistically significantly associated with lower chronic post-operative pain inguinal hernia pain. Crude Odds ratio (Crude OR) =0.29, 95% CI:0.11-0.72. Similarly, at multivariable analysis, hernia type (non-mesh) was the only factor independently associated with chronic post-operative pain hernia pain adjusted Odds ratio (aOR) =0.25, 95% CI:0.09-0.71.

### Discussion

There were 202 patients who underwent herniorrhaphy: mesh 131(64.9%) and non-mesh 71(35.1%) (Table 2). The rate of reported chronic postoperative inguinal pain after inguinal hernia repair in other studies ranged from 2% - 63% [7] The prevalence of chronic postoperative inguinal pain amongst patients who underwent mesh inguinal hernia repair in our study was 24.4 % (Table 4).

In a study conducted in Kenya, the prevalence of chronic post-operative inguinal pain was 30.2% after mesh hernioplasty<sup>[8]</sup> similar to our experience. We found the prevalence of chronic postoperative inguinal pain amongst patients who underwent non-mesh inguinal hernia repair was 8.5% (Table 4). In Uganda, a study found the prevalence of inguinodynia was 17% in patients who underwent the Darn and modified Bassini repair.<sup>[9]</sup>

Recurrence rates amongst patients who underwent inguinal hernia surgery vary considerably from one technique to another and is reported to range from less than 0.2% to 10%.<sup>[10]</sup> The recurrence rate of inguinal hernia amongst patients who underwent mesh inguinal herniorrhaphy in our hospitals was 3.1%. This finding is comparable

to a study conducted in Kenya, where they found the recurrence rate amongst patients who underwent mesh hernioplasty was 4.7%.<sup>[8]</sup> The recurrence rates amongst patients who underwent non-mesh repair in our study was 4.2% (Table 2). The recurrence rate for the Bassini technique varies between 10%-40%<sup>[11]</sup> and that for the Shouldice herniorrhaphy ranges from 0.6%-1.4%.<sup>[12]</sup>

There were more inguinal hernia recurrences in males as compared to females in both those who underwent mesh and non-mesh inguinal hernia repairs. There were four males who had recurrence after mesh hernioplasty while three had inguinal hernia recurrence after non-mesh inguinal herniorrhaphy. On the other hand, no females had inguinal hernia recurrence after mesh and non-mesh inguinal herniorrhaphy. Inguinal hernia recurrences after mesh and non-mesh inguinal hernia repairs were greater in the young male age groups and those above 65 years old than amongst females of comparable age groups (Table 3). This is probably due to the fact that more males than females are involved in strenuous physical activities which are risk factors predisposing to herniation. Further reasons for inguinal hernias being more in males are anatomic and developmental as the testes have to descend into the scrotum, an embryological process creating a weakness allowing for the development of inguinal hernia. Older people regardless of gender are most likely to have weak abdominal wall muscles compared to the young and so they are more prone to inguinal hernia.

Patients who underwent non-mesh inguinal herniorrhaphies experienced less inguinodynia than

**Table 4. Unadjusted and adjusted factors associated with chronic post-operative inguinal pain**

Patient characteristics	Proportion with pain n (%)	Crude OR (95%CI)	Adjusted OR (95%CI)
<b>Hernia repair type</b>			
Mesh	32 (24.4)	1.00	1.00
Non-Mesh	6 (8.5)	0.29 (0.11-0.72)	0.25 (0.09-0.71)
<b>Sex</b>			
Female	6 (21.4)	1.00	1.00
Male	32 (18.4)	0.83 (0.31-2.20)	1.12 (0.40-3.15)
<b>Age group years</b>			
19-30	7 (17.5)	1.00	
31-40	5 (14.7)	0.81 (0.23-2.84)	
41-50	5 (11.6)	0.62 (0.18-2.14)	
51-60	10 (29.4)	1.96 (0.65-5.90)	
61+	11 (21.6)	1.30 (0.09-0.48)	
<b>Occupation</b>			
Labourers and farmers	30 (21.6)	1.00	1.00
Civil servants	4 (18.2)	0.81 (0.25-2.57)	1.24 (0.33-4.61)
Motor cycle riders	3 (12.5)	0.52 (0.14-1.86)	0.75 (0.19-2.99)
Other	1 (5.9)	0.23 (0.03-1.78)	0.46 (0.05-3.95)

those who underwent mesh hernioplasty (8.5%, 24.4% respectively). More females (21.4%) experienced inguinodynia than males (16%) after non-mesh and mesh hernioplasty. This is comparable to a study, which showed that the prevalence of inguinodynia amongst patients who underwent the Shouldice herniorrhaphy, which is a non-mesh technique, was 7%.<sup>[13]</sup>

There were 174 (86.1%) males and 28 (13.9%) females (Table 4). In India, a study found 1 in 5 males and 1 in 50 females will develop inguinal hernia in their lifetime. 16 Furthermore, inguinal hernias are ten times more common in males than in females.<sup>[14]</sup> Therefore, more males than females develop inguinal hernia for the reasons described above.

The populations most affected are the young (18-40 years old) and the middle age (40-65 years old) (Table 1). The common inguinal hernia presentation amongst these patients is in Nyhus class 3 and 4 and these patients present with large, painful and longstanding inguinal hernia. Furthermore, most patients in Africa and who are in these age groups and with inguinal hernia present late to hospital or go untreated for a long time as compared to patients in the West<sup>[15]</sup> These huge hernias interfere with the patient's activities of daily living and impact negatively on socioeconomic activities.

The majority (80.7%) of the patients who underwent

both mesh and non-mesh inguinal hernia repairs were labourers or peasant farmers, and motorcycle riders (boda boda). This finding is similar to a study conducted in Mulago National Referral Hospital, Kampala.<sup>[16]</sup> This is probably because these occupations predispose them to acquiring inguinal hernias because of the increased intra-abdominal pressures as a result of involvement in strenuous physical activities such as digging, using oxen, or lifting heavy objects.

### Conclusion

Chronic postoperative inguinal pain was higher in the mesh repairs than in the non-mesh repairs.

Recurrences were higher, but not significantly so, among non-mesh inguinal hernia repairs than mesh repairs. Both the mesh and non-mesh inguinal hernia repair techniques are good techniques in reducing inguinal hernia recurrence. However, the disadvantage of the mesh hernioplasty is chronic postoperative inguinal pain. Thus, patients undergoing mesh or non-mesh inguinal hernia repairs need to be informed about the risk of inguinodynia.

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## Infant feeding during Covid-19

[The Lancet](#)

Globally, infants who are not exclusively breastfed are 14 times more likely to die than infants who are exclusively breastfed. Lockdown measures have diminished household income, and the UN World Food Programme estimates that by the end of 2020, 265 million people may be facing food insecurity, making breastfeeding even more important. WHO, the Royal College of Paediatrics and Child Health and others, have unanimously asserted that no evidence exists to suggest breastfeeding increases the risk of infants contracting COVID-19, and that skin-to-skin contact remains essential for newborn health and maternal health.