

## **Esophageal stricture causes and pattern of presentation at Ibn Sina Specialized Hospital**

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### **Abstract**

**Introduction:** The aim of this study is to evaluate the causes and pattern of presentation of esophageal stricture in Ibn Sina Specialized Hospital.

**Methods:** This is a retrospective study done at Ibn Sina Specialized Hospital during the period from April 2008 to December 2008. All patients had upper gastrointestinal endoscopy (UGIE), and those who were found to have esophageal stricture were enrolled in the study. The data collected were then processed and analyzed using appropriate statistical tests.

**Results and discussion:** Out of 780 patients who had UGIE, 60 were found to have esophageal stricture; 37(61.6%) were males. The age group ranged between 20 years and 89 years, with a mean ( $\pm$  SD) age of 50.483 ( $\pm$ 17.437) years.

Esophageal cancer of the squamous cell carcinoma type (SCC) was the most important cause of stricture in the study. In both genders, the cancer was common in the elder age groups.

Dysphagia was the commonest presenting symptom. Malignant and benign strictures were located at different site of the esophagus.

In males postsclerotherapy was more common especially in the young, while peptic stricture was common in elderly. In females peptic stricture and esophageal webs were common in young adults (20 – 50 years). Endoscopic dilatation was performed successfully to 59 patients. Only one male in the age group 60 – 69 years was managed with percutaneous endoscopic gastrostomy (PEG) tube due to failure of dilatation.

**Conclusion:** Esophageal stricture is an alarming sign of malignancy. Post-SCC stricture was detected in a considerable number of patients in our study group, therefore it require careful early diagnosis and distinction from other varieties because of their good outcome. Adenocarcinoma and other malignant tumors which cause esophageal stricture were not detected in our study group.

Alcohol consumption was not a significant risk factor contributing to the development of post-SCC stricture in this study.

Post-sclerotherapy stricture represented the peak in male farmers residing in the center of Sudan compared to females, other occupations and regions, and to other causes of benign stricture.

**Keywords:** dysphagia, schistosomiasis, achalasia, adenocarcinoma, squamous.

**E**sophageal stricture is a relatively common disease. It is frequently due to benign causes including motility disorders or malignant causes. Malignant causes should always be considered because of their seriousness.

Strictures usually occur in the distal esophagus and typically tend to be 2-4cm long, but may involve the entire length of the thoracic esophagus<sup>1</sup>.

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Strictures generally develop over a period of months but occasionally develop more rapidly over several weeks.

Most strictures cease to worsen when the esophagus is narrowed to a diameter of 1.5-2cm which is often sufficient to impair swallowing and produce dysphagia. Benign strictures always demand careful differential diagnosis from esophageal neoplasia.

The majority of benign strictures that are found in the esophagus results from long-standing gastroesophageal reflux<sup>2,3</sup>.

The frequency of benign esophageal stricture has decreased in parallel with the wide availability of proton pump inhibitors.

The commonest presentation of stricture is dysphagia; nevertheless, other symptoms and signs may be the presenting cause.

The aim of this study is to evaluate the causes and pattern of presentation of esophageal stricture in Ibn Sina Specialized Hospital-Khartoum Sudan.

**Methods:** This is a prospective study done at the endoscopy unit of the gastroenterology department in Ibn Sina Specialized Hospital during the period from April 2008 to December 2008. A structured questionnaire was prepared. Informed consents were obtained from all patients. Upper gastrointestinal endoscopy was performed in the conventional way- attended by the researcher-. Patients who were found to have esophageal stricture were enrolled in the study. The medical history was taken and clinical examination was performed to the patients. The data collected were then processed and analyzed using appropriate statistical tests.

### Results

Out of 780 patients attending the endoscopy department in Ibn Sina Hospital for endoscopy for different gastrointestinal diseases, 60 were found to have esophageal stricture. Out of these patients 61.7 % were males. The age of presentation ranged between 20 years to 88 years with a mean  $\pm$  standard deviation (SD) of  $50.4 \pm 17.5$  years. In males, the age group 70 – 79 years, comprising ten (27.8%) patients represented the bulk of males, while in females the age group 40 – 49 years, comprising seven (30.4%) patients represented the bulk (table 1). The majority (63 %) of our patients were from the center of Sudan; ten (16.7%) from the West, seven (11.7%) from the North, four from the East (6.7%) and one patient from the South (1.7%).

The majority (82.6%) of the females were housewives, while farmers constituted the majority (54.0%) in males. The majority (56.7%) of patients were illiterate. All

females were neither smokers, snuffers nor alcohol consumers, while six (16.2%) males were smokers, seven (20.5%) snuffers and two (5.4%) alcohol consumers.

Dysphagia was the commonest symptom in our study group, being detected in (97.3 %) males and in all female patients. In males it was more common (ten patients = 27.8%) at the age group 70 – 79 years .Thirty three male patients had dysphagia mainly for solid food, while only three had it mainly for liquid .

In females 26% of patients with dysphagia were at the age group 20 – 29; it was mainly for solid food in 19 and mainly for liquids in four patients.

Dysphagia for solid food caused by benign stricture was detected in 55% of all patients (males (59.4%); females (47.8). The most common cause in males was postsclerotherapy stricture, while peptic stricture was the commonest cause in females.

All patients with post SCC stricture had dysphagia for solid food. Dysphagia for liquids was detected in all patients with achalasia.

Odynophagia was common in male patients in the age group 50 – 59 years (three patients). In females it is common in the age group 20 – 29 years (three patients). Food impaction was detected in only one male patient (2.7%) in the age group 30 – 39 years it was not detected in any female. Heartburn was common in males in the age group 70 -79 years (six patients). In females it was common in the age group 40 – 49 years (five patients). Dyspepsia was observed in males maximally in the age group 70 – 79 years (six patients). In females the maximum number being detected in the age group 40- 49 years (five patients). Regurgitation in males was detected maximally in the age group 40- 49 years (four patients). In female it was observed maximally in the age group 40– 49 years (four patients). (table 1)

Table (1): Distribution of symptoms of esophageal stricture within successive age groups

age	G	D	O	F	H	DYS	R	AS	Oth
		No (%)	No (%)	No (%)	No(%)	No (%)	No (%)	No(%)	No (%)
20-29	Male	4(100)	0 (0)	0 (0)	1 (25)	1 (25)	0 (0)	0 (0)	0 (0)
	Female	6(100)	3 (50)	1(16.7)	1(16.7)	2 (33)	2(33.3)	0 (0)	3 (50)
30-39	Male	4(80)	2 (40)	1 (20)	0 (0)	1 (20)	1 (20)	0 (0)	1 (20)
	Female	3(100)	0 (0)	0 (0)	1 (33)	1(33.3)	2(66.7)	0 (0)	0 (0)
40-49	Male	4(100)	1 (25)	0 (0)	1 (25)	1 (25)	1 (25)	0 (0)	2 (50)
	Female	7(100)	2 (28.6)	0 (0)	5(71.4)	5(71.4)	4(57.1)	0 (0)	2 (28.6)
50-59	Male	6(100)	3 (50)	0 (0)	4(66.7)	2(33.3)	4(66.7)	0 (0)	1 (16.7)
	Female	3(100)	0 (0)	0 (0)	0 (0)	0 (0)	1(33.3)	0 (0)	1 (33.3)
60-69	Male	7(100)	2(28.6)	0 (0)	1(14.3)	2(28.6)	2(28.6)	0 (0)	1 (14.3)
	Female	3(100)	1(33.3)	0 (0)	0 (0)	1(33.3)	1(33.3)	0 (0)	0 (0)
70-79	Male	10(100)	2(20)	0 (0)	6 (60)	6 (60)	2 (20)	0 (0)	2 (20)
	Female	1(100)	1(100)	0 (0)	1(100)	1(100)	0 (0)	0 (0)	0 (0)
80-89	Male	1(100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
	Female	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total		59(98.3)	17(28.3)	2 (3.3)	21(35)	23(38.3)	20(33.3)	0 (0)	13(21.6)

G=gender, D= dysphagia, O= odynophagia, F= food impaction, H= heart burn, Dys= dyspepsia, R= regurgitation, As= aspiration pneumonia, Oth= other

Table (2): The distribution of clinical signs of esophageal stricture within successive age groups .

Age	G	A	C	LN	H	S	Asc	Oth
		No(%)	No (%)	No(%)	No (%)	No (%)	No (%)	No (%)
20-29	Male	3 (75)	0 (0)	0 (0)	2 (50)	2 (50)	1(25)	0 (0)
	Female	4(66.7)	0 (0)	0 (0)	1(16.7)	1 (16.7)	0 (0)	0 (0)
30-39	Male	2 (40)	0 (0)	1 (20)	1 (20)	2 (40)	0 (0)	0 (0)
	Female	2 (66.7)	1 (33.3)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
40-49	Male	2 (50)	2 (50)	1 (25)	1 (25)	1 (25)	0 (0)	0 (0)
	Female	2 (28.6)	2 (22.6)	0 (0)	1 (14.3)	0 (0)	1(14.3)	1(14.3)
50-59	Male	3 (50)	0 (0)	0 (0)	1(16.7)	3 (50)	0 (0)	0 (0)
	Female	2 (66.7)	1 (33.3)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
60-69	Male	5(71.4)	4 (57.1)	0 (0)	1(14.3)	1 (14.3)	2(28.6)	1(14.3)
	Female	0 (0)	2 (66.7)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
70-79	Male	3 (30)	1 (10)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
	Female	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
80-89	Male	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
	Female	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total		31(51.6)	13(21.6)	2(3.3)	8(13.3)	10(16.6)	4(6.6)	2 (3.3)

G= Gender, A= Anaemia, C= Cachexia, LN= Lymph Node enlargement, H= Hepatomegally, S= Splenomegally, Asc= Ascites, Oth= Others

Clinical anemia was detected in males and females maximally in the age group 60 – 69 years. Cachexia was detected maximally in males in the age group 60 – 69 years while it was seen in females maximally in the age group 40 – 49 years. The entire seven male and the six female patients with cachexia had post-SCC esophageal stricture. Lymph node enlargement was detected in two male patients, one in the age group 30 – 39 years while the other was in the age group 40– 49 years. In contrast, no lymph node enlargement had been detected in females. Splenomegally in males was common the age group 50 – 59 years. In females it was detected in only one patient (4.7%) in the age group 20 – 29 years. Ascites was common in males at the age group 60– 69 years. In females, it was detected in only one patient at the age group 40– 49 years (table 2).

In males the maximum number of benign strictures occurred in the age group 70– 79 years. In females it was common at the age group 20- 29 years. The causes of benign strictures detected were postsclerotherapy, achalasia, peptic and webs. Other causes like

corrosive and other motility disorders, etc, were not detected in our group study. Postsclerotherapy stricture was common in males. It was maximally observed in the age groups (20– 29; 30- 39; and 50– 59 years), with three patients in each age group. In females, it was observed in only one (6.7%) patient in the age group 20– 29 years. Achalasia was common at the age group 50– 59 years in males. While in females it was common at the age group 20– 29 years. Peptic stricture was found maximally in males in the age group 70– 79 years. In females it was common at the age group 40– 49 years. Post-esophageal ring stricture was common in females at the age group 20– 29 years . None of the male patients had post- esophageal ring stricture. Malignant strictures detected were of the SCC type in both genders. Adenocarcinoma and other malignancies were not detected. Stricture caused by SCC in males was detected maximally at the age group 60– 69 years. In females it was common at the age groups 40– 49, 50– 59 and 60 – 69 years (table 3).

Table (3): Type of stricture in successive age groups

Age	G	Ms		Benign stricture			Total No(%)
		N (%)	No(%)	A No(%)	P No(%)	Oth No(%)	
20-29	Male	0 (0)	3 (75)	0 (0)	1(25)	0(0)	4 (100)
	Female	0 (0)	1(16.7)	2(33.3)	1(16.7)	2(33.3)	6(100)
30-39	Male	1 (20)	3(75)	0 (0)	1(25)	0 (0)	4(80)
	Female	1(33.3)	0 (0)	0 (0)	1(50)	1(33.3)	2(66.6)
40-49	Male	2 (50)	1(50)	0 (0)	1(50)	0 (0)	2(50)
	Female	2(28.6)	0 (0)	1 (20)	4(80)	0 (0)	5(71.4)
50-59	Male	0 (0)	3(50)	2(33.3)	1(16.7)	0 (0)	6(100)
	Female	2(66.7)	0 (0)	1 (100)	0 (0)	0 (0)	1(33.3)
60-69	Male	4(57.1)	1(33.3)	1(33.3)	1(33.3)	0 (0)	3(42.8)
	Female	2(66.7)	0 (0)	0 (0)	1(100)	0 (0)	1(33.3)
70-79	Male	3 (30)	1(14.3)	1(14.3)	5(71.4)	0 (0)	7(70)
	Female	1(100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
80-89	Male	1(100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
	Female	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

G= Gender, MS= malignant stricture, Ps= Post-sclerotherapy, A= Achalasia, P= Peptic, Oth=Other

Malignant and benign strictures location was as follows: no benign esophageal stricture in the upper third was detected, where as three (8.1%) male patients had postsclerotherapy stricture in the middle third, two of them in the age group 70– 79 years. In females two (8.6%) patients in the age group 50– 59 years, one with postsclerotherapy stricture and the other with peptic stricture were found in the middle third. In the lower third, 23 (62.1%) male patients had stricture, with the maximum number ( five ) detected in the age group 50– 59 years, while in females 13 patients (56.5%); the maximum number (six patients) was detected the age group 40- 49 years were found at this site (table 4).

Savary dilatation was performed in 31 (83.8%) male patients with a maximum number of patients in the age group 70– 79 years. In females, it was common at age group 20– 29 years. Balloon dilatation was common at the age group 50– 59 years and 70– 79 years in males. In females, four (17.4%) patients under went balloon dilatation with a peak number in the age group 40- 49 years (table 5).

One male patient in the age group 60 – 69 years, with SCC in the lower third of the esophagus was managed with peg tube due to failure of dilatation.

Table (4): The site of malignant and benign stricture within successive age groups

Age	G	Malignant			Benign			Total
		U No(%)	M No(%)	L No (%)	U No (%)	M No(%)	L No(%)	
20-29	Male	0 (0)	0 (0)	0(0)	0 (0)	0 (0)	4(100)	4(100)
	Female	2(33.3)	0 (0)	0 (0)	0 (0)	0 (0)	4(66.7)	6(100)
30_39	Male	0 (0)	0(0)	0 (0)	0 (0)	0 (0)	5 (100)	5 (100)
	Female	1(33.3)	0(0)	0 (0)	0 (0)	0 (0)	2(66.7)	3(100)
40-49	Male	1 (25)	0 (0)	0 (0)	0 (0)	1(25)	2 (50)	4(100)
	Female	0 (0)	0 (0)	1(14.2)	0 (0)	0 (0)	6(85.8)	7(100)
50-59	Male	0 (0)	0 (0)	1(16.6)	0 (0)	0 (0)	5(83.3)	6 (100)
	Female	0 (0)	1(33.3)	0(0)	0 (0)	1(33.3)	1(33.3)	3(100)
60-69	Male	2(28.6)	0(0)	1(14.2)	0 (0)	0 (0)	4(57.1)	7 (100)
	Female	0 (0)	1(33.3)	0(0)	0 (0)	1(33.3)	1(33.3)	3 (100)
70-79	Male	0 (0)	2 (20)	3( 30)	0 (0)	2 (20)	3(30)	10(100)
	Female	0 (0)	1(100)	0(100)	0 (0)	0 (0)	0 (0)	1(100)
80-89	Male	0 (0)	0 (0)	1(100)	0 (0)	0 (0)	0 (0)	1(100)
	Female	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

G= Gender, U=Upper third, M=Middle third, L=Lower third.

## Discussion

This is a retrospective hospital based study carried out in Ibn Sina hospital in Khartoum in the period from April 2008 to December 2008. It included 60 patients out of 780 (7.6%) out patients attending the endoscopy department for different indications. All the 60 patients in our study group were diagnosed endoscopically as having esophageal stricture caused by different pathologies.

The study had revealed that the number of

male patients is greater than the number of female patients (37 versus 23).

Benign esophageal strictures were more common in males than in females (70.3% versus 65.2%); while malignant esophageal stricture was more common in females than in males (34.8% versus = 29.7 %). However, this may not reach statistical significance. Nevertheless, it is different from the incidence in the United states where in high incidence regions there is no gender specificity<sup>4, 5</sup>.

Table(5): Savary and balloon dilatation within successive age groups

Age	Gender	Savary dilatation	Balloon dilatation
		N (%)	N (%)
20-29	Male	4 (100)	0 (0)
	Female	6 (100)	0 (0)
30-39	Male	5 (100)	0 (0)
	Female	3 (100)	0 (0)
40-49	Male	4 (100)	0 (0)
	Female	5(71.4)	2 (28.6)
50-59	Male	4 66.7)	2 (33.3)
	Female	3 (100)	0 (0)
60-69	Male	5(71.4)	1(14.3)
	Female	2(66.7)	1 (33.3)
70-79	Male	8 (80)	2 (20)
	Female	1(100)	0 (0)
80-89	Male	1 (100)	0 (0)
	Female	0 (0)	0 (0)
Total		51(85)	8(13.3)

In males, benign esophageal stricture occurred maximally (27.8%) in elderly age groups 70 – 79 years this agree with what is mentioned in the literature<sup>6</sup> compared to malignant stricture, which occurred maximally in a relatively younger age group 60- 69 years . In females, benign esophageal stricture occurred maximally in a much younger age group 40 – 49 years (21.7%)); while malignant type was distributed within old age groups. This also agrees with what was mentioned in the literature<sup>6</sup>.

The majority (63.3%) of patients in our study group were from center of Sudan. This may be explained by the fact that the center of the country is inhabited with the bulk of population compared to other regions.

The largest group (51.4%) of male patients was farmers. Twelve (63.1%)of them were diagnosed with post-sclerotherapy stricture; this is different from what was mentioned in the literature<sup>7</sup> and is probably because farmers are much more exposed and so susceptible to portal hypertension complicating schistosomiasis and, hading developed varices

, have had several episodes of haematemesis and subsequently underwent repeated sessions of sclerotherapy complicating esophageal stricture formation in a considerable percentage of them ; in contrast only one female patient developed post-sclerotherapy stricture. This is different from what was mentioned in the literature<sup>7</sup>. However, it could be explained by the fact that females are usually less exposed to schistosomiasis and its complications like varices.

The majority (56.7%) of patients in our study group were illiterate, while only one patient had university level of education ; this may be explained by the fact that educated people usually adopt a rather healthy habits and probably seek early medical advise as well as private medical advice while illiterate patients usually present late with complications; moreover this correlate with the literature in the epidemiology of esophageal cancer which is more common in low socioeconomic class<sup>4</sup>. Two out of 37 (3.3%) male patients claimed alcohol consumption, this represents only a minor percentage in our study group and therefore is not a significant figure contributing to the pathology leading to development of esophageal stricture. In the literature alcohol is a major risk for SCC<sup>3</sup>.

Dysphagia was a common symptom in our study group. This correlates with the literature which revealed that, it is the most frequent symptom of both benign and malignant strictures<sup>8</sup>. It was detected in almost all male patients (36 out of 37 males = 97.3%) and in all female patients (23=100%).

22 male and 11 female patients with benign strictures caused by peptic, post-sclerotherapy and esophageal rings lesions had dysphagia mainly for solid food ; all had mechanical lesions , in contrast four male and four female patients diagnosed with post- achalasia esophageal stricture had dysphagia mainly for liquids ;therefore these results do not contradicted what had been mentioned in the literature<sup>8</sup>.

Odynophagia was a common symptom in our study group, being detected in 27% in male patients and in 30.4 % in females. This does not keep with the literature which state that

odynophagia is a frequent symptom of esophagitis and esophageal ulcer commonly caused by esophageal infections and inflammation but is an unusual symptom of GERD and when present usually indicate esophageal ulcer<sup>7,9</sup>.

Food regurgitation was detected in all males with achalasia ( four patients ) and also in all females with achalasia ( four patients ). This does not keep with what is mentioned in the literature which states that 40% of patients with achalasia have food regurgitation<sup>2</sup>; we could not find explanation for this in our study group.

The lower third had been found to be the commonest site for both benign and malignant strictures in both genders in our study group (table 4)

This correlates with the literature which states that the lower third of the esophagus is the commonest site for benign peptic esophageal stricture formation as a result of chronic reflux esophagitis<sup>1,2</sup>.

This lower third was also the commonest site for malignant (SCC) stricture development in our study group. This finding which is not in keeping with literature could not be explained<sup>3</sup>.

Benign strictures were more common than malignant stricture in both males and females in our study group (table 3). This may be explained by the fact that the predisposing factors for diseases complicating benign esophageal stricture in our study group (peptic, post-sclerotherapy) are predominant in our community compared to the etiological factors implicated in the development of SCC elsewhere, which are mainly smoking and alcohol<sup>3</sup>.

The most common cause of benign strictures in our study group in males was sclerotherapy for esophageal varices; this is because most of our patients in the study were farmers. This is different from which was mentioned in the literature which stated that in one study it was detected in 15.5% of patients who received repeated sessions of sclerotherapy<sup>7</sup>. Peptic lesions and achalasia were less common causes of stricture in males in our study

group. In females, the most common cause of benign strictures was peptic stricture.

SCC was the only malignancy implicated in the development of esophageal stricture in our study group. It was detected in 11 males (29.7%) and 8 females (34.8%). This agrees with what was mentioned in the literature<sup>1,2</sup>.

Smoking was not a significant etiological factor contributing to development of post-SCC stricture formation in our study group, as none of the females was smoker and only six males were smokers, two of them in the young age group 30- 39 years. Only one patient in the old age group 60 – 69 years and one in the elderly 70 – 79 years group are smoker. This does not correlate with the literature which state that smoking and alcohol are important etiological factors in the development of esophageal SCC in Western community<sup>3</sup>. Being prohibited by implementation of Islamic Sharea law; alcohol role in health is declining. Also smoking is no longer attractive. These factors can partially explain these differences. Low socioeconomic status is a significant etiological factor contributing to the development of SCC in our study group as most of our patients are illiterate (56.7%), and farmers (33.3%). This correlates well with the literature<sup>4</sup>.

Most patients in our study group were managed with Savary dilatation for relieve of the esophageal stricture. This may be explained by the fact that most of the strictures in our study group are long and narrow requiring mechanical dilatation aided by a guide wire. This goes with what is mentioned in reports<sup>2</sup>.

Only one male in the age group 60 – 69 was managed with percutaneous endoscopic gastrostomy (PEG) tube due to failure of dilatation. In the literature, it was mentioned that this is an effective procedure for gastric decompression caused by upper gastrointestinal cancer<sup>10</sup>.

### Conclusion

Esophageal stricture is an alarming sign of malignancy. Post-SCC stricture was detected in a considerable number of patients in our

study group, therefore it require careful early diagnosis and distinction from other varieties because of their good outcome.

The relatively high percentage of post-SCC stricture detected in residents of center of Sudan in our study group is explained by the high percentage of population in this region. Post-sclerotherapy stricture represented the peak in male farmers residing in the center of Sudan compared to females, other occupations and regions, and to other causes of benign stricture. The hyperendemicity of schistosomiasis with portal hypertension is probably behind that.

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