Original Article

Esophageal Stricture Post Endoscopic Injection Sclerotherapy

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Abstract

Background: Post endoscopic sclerotherapy esophageal stricture is usually not fatal but may requires several sessions of esophageal dilation as an effective palliative treatment yet has its own complications.

Aim: The purpose of this study is to find out the predictors of sclerotherapy esophageal stricture.

Methods: This is a cross sectional descriptive study of the esophageal stricture post sclerotherapy for the patients who were managed in the period from January 2000 through the June 2007 in endoscopic department at Ibn Sina Hospital. Post endoscopic sclerotherapy symptoms, signs, diagnostic and therapeutic methods were analysed to find out possible predictors of developing benign esophageal stricture.

Result: A 33 out of 10133 patients who had sclerotherapyl were found to have esophageal stricture and were included in this study. 91% of them were males, 88% were <60years old and most of them were cases of hepatic periportal fibrosis. Only two patients had esophageal varices secondary to viral hepatitis B liver cirrhosis. Their presentation was commonly with difficulty in swallowing and few cases presented with food impaction. The majority of patients were treated with wire guided endoscopic Savary Gilliard dilation.

Conclusion: Esophageal stricture following endoscopic injection sclerotherapy is a known morbidity; however the rate of these strictures is fairly acceptable. High dose of sclerotherapy in fewer sessions over a short period are potential predictors of esophageal stricture.

Key words: Esophageal varices, benign esophageal stricture

Ibn Sina Hospital is a specialized referral tertiary hospital directly supervised by the National Gastrointestinal and Liver Diseases Centre (NGLC) in Khartoum, Sudan. The endoscopic department in Ibn Sina Hospital (ISH) and Mohammed Salih Idris's Centre for Gastrointestinal Bleeding is the largest referral centre for both elective and emergency gastro-intestinal (GI) bleeders in the Sudan. In seven years (2001-2007) 10133 patients had sclerotherapy. Those who were managed electively with endoscopic injection sclerotherapy (EIS) in two years (2006-2007) were 3557patients.

The acquired benign esophageal stricture (BES) is a common complication which may follow many esophageal disorders, such as gastro - esophageal reflux, ingestion of corrosive agents, esophageal surgery, radiotherapy, post-endoscopic variceal sclerotherapy, drug ingestion, prolonged naso-gastric intubation, and extrinsic compression [1,2]

BES following EIS is usually not fatal but may require frequent dilation of the esophagus which itself is not without complications.

Aims: To find out the predictors of post EIS esophageal stricture.

Patients and methods: This is a cross-sectional hospital based descriptive study of the esophageal stricture post-EIS for patients treated in the period from January 2000 through June 2007. Medical records of patients who had sclerotherapy during that period were retrieved and biomedical data were collected. Post EIS symptoms, signs, diagnostic procedures and methods of treatment were noted and analyzed to find possible predictors for developing post-EIS esophageal stricture.

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Results:
Out of 10133 patients who underwent sclerotherapy in the mentioned period only 33 had stricture and were included in this study. 30 of these were males (91%). Most of the patients belong to the young adult age group as shown in table1. Esophageal varices resulted from portal hypertension secondary to periportal fibrosis which is commonly due to Bilharziasis in the Sudan. However, two cases of portal hypertension were secondary to post hepatitis B liver cirrhosis (table 1).

Table 1: Causes and management of post EIS strictures.

Age	Sex		Cause		Dilation	
	M	F	PPF	LC	No SD	SD
10-19	1	1	2			2
20-29	1	1	2			2
30-39	7	1	7	1	2	6
40-49	7		7			7
50-59	10		10		1	9
60+	3		3			3
unknown	1			1	1	
Total	33 patients					

LC=liver cirrhosis, SD= Savary-Gilliard dilation

Ethanolamine oleate 5% was used for EIS in all (97%) apart from one (3%) patient who was injected with Sodium Tetradycyl Sulfate (STDS).
Post EIS presentations were difficulty in swallowing in all cases. The duration of treatments before stricture development was illustrated in table 2.
Endoscopic findings showed various degrees of esophageal strictures. The majority of patients were then treated with endoscopic Savary-Gilliard dilation (SD). Fluoroscopy was not required during these procedures. The largest group (12 patients) of patients developed BES in < 6 months while another large group (9 patients) had it in> 36 months.
Discussion: In this study 10133 patients had EIS on regular basis. They had a total number of 30399 sessions (mean number of sessions of sclerotherapy was 3) only 33 patients developed post-sclerotherapy esophageal stricture. So, among our patients the chances for eveloping post-sclerotherapy stricture was around 0.3%. On the other hand, in one local study[3] the rate of post EIS strictures was 2.9%. The relatively larger sample size in our study gives it more weight. Also, our results were augmented by the reasonable improvement in documentation of the patients' data, which were computerised in the Statistics Department at Ibn Sina Hospital.
Post EIS stricture presentation was difficulty in swallowing in all our cases which is similar to literature[4].
The majority (88%) of our patients were <60 years old. This is because most of our patients were productive young farmers suffering of esophageal varices as a consequence of portal hypertension secondary to Bilharzial periportal fibrosis in the major agricultural schemes in Zaidab, Gazeera area, Rahad, Halfa Elgadeeda Irrigation Schemes. This fact is in keeping with results of other local studies[5].
All cases with stigmata of chronic liver disease were screened for hepatitis B and C. HBsAg was reported previously to affect between 5.1% - 10%[5-7] of patients, going with that we found two (6%) out of 33 post-sclerotherapy esophageal stricture patients to have liver cirrhosis secondary to viral B hepatitis. This could be supported by the fact that few percentage (<5%) of patients who contract HBV infection in adult hood will not clear the virus. However more sensitive tests and liver biopsies are required to verify the true percentage of patients with bleeding varices due to chronic HBV infection alone or concomitant with Bilharzial periportal fibrosis.
The endemicity of Bilharzia and its complications especially the periportal fibrosis with the consequences of upper GIT bleeding that has high mortality and morbidity should trigger the re-evaluation and

Table2: Development of stricture in relation to sex, time, and dose of sclerothrapy.

				Duration of sclerotherapy (In months)							
Sex	Session	Dose	Av. Dose/se	Not Reg	< 6	12-17	18-23	24-29	30-35	36+	Total
F.	1-2	50 -100	50	-	1	-	-	-	-	-	1
	3-4	50 -100	21.43	-	-	-	-	-	-	1	1
	7 plus	> 100	14.28	-	-	-	-	-	-	1	1
M.	1-2	Not reg.		1	-	-	-	-	-	-	1
		< 50	33.33	1	3	-	1	-	1	-	6
		50 -100	57.8	-	4	-	-	-	-	-	4
	3-4	< 50	14.28	-	1	-	-	-	-	-	1
		50 -100	21.43	-	3	3	1	-	-	1	8
	5- 6	Not reg.		1	-	-	-	-	-	-	1
		< 50	9.09	-	-	-	1	-	-	-	1
		50 -100	13.6	-	-	-	-	-	-	2	2
		>100ml	18.18	-	-	-	-	-	-	2	2
	7 plus	< 50	7.14	-	-	-	-	-	-	1	1
		50 -100	10.71	-	-	-	-	-	1	-	1
		> 100	14.28	-	-	-	-	1	-	-	1
	Not reg.	50 -100		-	-	-	-	-	-	1	1
Total				3	12	3	3	1	2	9	33

reconsideration of the cost-effectiveness of the above mentioned agricultural schemes. Intensive Bilharzial eradication measures (WHO system) including biological, chemical and mechanical measures should be applied to these areas to reduce the negative impact of these schemes on the citizens. Not only that; but we advocate for early health planning, public medical education, eradication measures which should be strictly and firmly applied to the newly constructed agricultural schemes in the Northern and River Nile States particularly El Hamdab and El Silaim, agricultural schemes to avoid the catastrophic consequences of Bilharzia.

For sclerotherapy we used ethanolamine oleate 5%, which is prepared in our local pharmacy, and therefore it is cheap and available. In contrast, international studies showed that there is no significant difference in efficacy or complication with regard to the substance used being absolute alcohol, ethanolamine oleate, or sodium tetradycyl sulfate [8].

The duration and dosage of sclerotherapy before development of strictures was variable (Table 2). However, it is clear in this study that esophageal stricture development has two peaks. The 1st one included the largest group (12) and had it in less than six months of sclerotherpy; all of these patients had <4 sessions of therapy and the larger the dose per-session (e.g. 57.8) the more likely the development of stricture, while the 2nd peak occurred later (>36 months) and a gain the stricture was more in those who had larger doses of slerosing agent. This finding is consistent with reports from Japan[4].

Both intra-variceal and para-variceal injections are effective for controlling and preventing future bleeding from esophageal varices. However, as in the majority of interventional methods of treatment it is probably not easy to randomise patients for intra-variceal and para-variceal injections to find out the impact of these particular methods on development of esophageal strictures. Injections of the sclerotherapy

should be applied in a spiral fashion starting at the distal end of the esophagus. Conversely, circumferential injection particularly dictated by the active bleeding may lead to esophageal stricture[9]. Also, the length of the tip of the needle passing into the submucosa of the esophagus or its muscularis propria may create severe inflammatory reaction and necrosis ending in stricture or delayed perforation of the esophagus. To save guard against this, the injecting doctor should make sure- as possible as he can- that he is injecting either intra-variceal or para-variceal in the sub-mucosa and should not push in the needle hard to reach the muscularis propria. In this retrospective study it was difficult to identify the site and depth of the injections.

For the management of bleeding esophageal varices EIS is feasible, safe, effective and cost effective in comparison to band ligation or surgery which cost 300 Sudanese Pound (SP) per session and 2000 SP (150-1000 US$) respectively while EIS costs only 50-70 SP(20-30 US$) per session. Nevertheless, it is important to state that centres providing this kind of treatment should be in proximal vicinity i.e. in regional hospitals within the agricultural schemes in order to reduce the cost of the procedure and also reduce the load on the referral treating centres.

Conclusion: Esophageal stricture is a known morbidity following EIS. However the rate of this stricture is fairly acceptable. The larger the dose of sclerosing agent per-session, the greater the chance of developing stricture. The potential predictor mentioned necessitates further multi-centric and prospective studies for clarification and also for formulation of national guidelines for sclerotherapy.

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