

Original Article

SAVARY-GUILLIARD DILATORS FOR MANAGEMENT OF CORROSIVE ESOPHAGEAL STRICTURES WITHOUT USING FLUOROSCOPE: FIVE-YEAR EXPERIENCE IN PAKISTANI POPULATION

Mahmood Ahmad, Yasir Mahmud, Sidra Rasheed, Naeem Afzal, Naseer Umer and Muhammad Arif Nadeem

Objective: To evaluate the safety and effectiveness of Savary-Guilliard dilators in corrosive esophageal strictures without using fluoroscopic monitoring.

Methods: A total of 307 patients with corrosive esophageal strictures who underwent endoscopic dilatation using Savary-Guilliard dilators were included in the study. Procedures were repeated after every 2-4 weeks to assess the outcome and further need of dilatation. Treatment was considered successful if the patient was able to tolerate a solid/semisolid meal for a period of >6 months without further need of dilatation.

Results: Nine hundred eighty three dilatations were performed in 307 patients. The mean number of sessions performed per patient was 3.2. Treatment success was obtained in 277 patients (90.2%). Treatment failure was noted in 18 patients (5.9%) and 12 patients (3.9%) lost to follow up. Perforation occurred in 8 (2.6%) patients that were managed conservatively.

Conclusions: Dilatation of corrosive esophageal strictures with Savary-Guilliard dilators without using fluoroscope is efficacious and safe.

Keywords: corrosive esophageal strictures, dilatation, savary-guilliard dilators, outcome.

Introduction

Corrosive injury of the upper gastrointestinal tract is a frequently encountered problem worldwide especially in the developing countries. Inadequate public education and lack of law enforcement in the sale of caustic substances are its main reasons. Corrosive injuries occur more frequently in children due to accidental ingestion of the caustic agents.¹ While in adults the usual cause is suicidal or homicidal intake.² Occasionally, ingestion of caustic agent is seen in psychiatric or alcoholic patients.³ In western countries, alkaline corrosive injuries are more common, whereas acid injury is more common in developing countries due to easy accessibility of agents.⁴ Acidic solutions cause more injury to the gastric tissue compared to esophagus.^{5,6} Upper GI endoscopy is the gold standard investigation to assess the extent of corrosive injury and presence of esophageal stricture.⁷ Once an esophageal stricture is formed as a consequence of corrosive intake, endoscopic dilatation is an effective & commonly performed procedure.^{8,9} Two commonly used methods are endoscopic balloon dilatation & bougie dilatation called Savary Guilliard dilators. Fluoroscopy is recommended by some authors to monitor the proper positioning of a guide wire and subsequent dilatation.^{2,10} However, many experts believe that there is no need of routine fluoroscopic monitoring during Savary-Guilliard dilatation. In

this study we described our experience of corrosive stricture dilatation with Savary-Gilliard dilators in local population without routine fluoroscopic monitoring.

Methods

It was a retrospective observational study conducted at department of gastroenterology, SIMS/Services Hospital Lahore. All patients who presented with corrosive esophageal stricture and underwent endoscopic dilatation between June 2013 to May 2018 were included in the study. A total of 307 patients were included in our study. All the dilatations were performed using Savary-Guilliard dilators passed over a guide wire, without using the fluoroscope. Barium swallow was performed before dilatation in all the cases who presented after 24 hours of caustic ingestion. The rule of three was used while dilating the strictures and maximum dilation was performed up to 15mm (45 Fr). An immediate post procedure endoscopy was performed in all patients to look for any complication e.g. bleeding or mucosal tear. After the procedure, patients were observed for a period of about 4-6 hours and in case of persistent chest pain, a radiograph of chest was obtained to check for perforation. Procedure was repeated after every two to four weeks to assess the outcome of previous dilatation and need for further dilatation. In cases where the dysphagia or stricture recurred during the follow-up, additional dilatation was performed until

the dysphagia resolved. All the procedures were carried out under midazolam sedation. Treatment success was defined by the ability of patients to tolerate a solid/semisolid meal for at least 6-month period without repeated dilations. The data was analyzed using SPSS version 22 (IBM SPSS Statistics for Windows). Categorical data were expressed as percentages and continuous variables were expressed as mean, standard deviation, range, maximum, and minimum.

Results

In total, 983 dilations were performed in 307 patients over a period of five years. Among these 104 patients (33.9%) were male and 203 were female (66.1%). The mean age (+ SD) of patients was 28.7 years (+2.31). The mean number of dilations per patient was 3.2 with a range between one and five. Treatment success was achieved in 277 patients (90.2%) and treatment failure was noted in 18 patients (5.9%). 12 patients (3.9%) were lost to follow up and esophageal perforation occurred in 4 patients that were managed conservatively. No other significant procedure related complication was noted.

Table-1: Characteristics of study participants and outcome of Savary dilators.

Variables	n=307	
Gender	Male (%)	104 (33.9)
	Female (%)	203 (66.1)
Mean Age±SD		28.75±2.31
Stricture location (%)	Upper	32 (10.4)
	Midle	235 (76.5)
	Lower	40 (13.1)
Mean Dilatations per patient (range)		3.2 (1-5)
Treatment success (%)		277 (90.2)
Treatment success (%)		18 (5.9)
Lost of fullow up		12 (3.9)
Complications (%)	Severe bleeding	0 (0)
	Perforation	04 (.01)
	Death	0 (0)

Discussion

Corrosive ingestion is an important public health issue that has affected not only the developing world but also the developed countries despite all the educational and regulatory efforts.^{11,12} Post caustic ingestion, the esophageal stricture formation is reported in upto 77% of cases.¹³ The peak incidence of stricture formation is around 8th week after ingestion, although it may develop as early as 2 weeks post ingestion.¹³⁻¹⁵ Endoscopic

dilatation of the stricture is the recommended procedure to relieve dysphagia.¹⁶ We used Savary-Guilliard dilators in our study and the results showed that it's a successful and safe procedure without the need of fluoroscopic monitoring. There were no serious procedure related complications. All patients had dysphagia due to esophageal strictures and symptom relief was achieved in 90.2% patients. Our results are similar to the study performed by Yong-Wang et al in 2012 at Peking University People's Hospital Beijing, China.¹⁷ Fifty-five patients with esophageal strictures were dilated endoscopically using Savary-Guilliard dilators. A total of 401 dilations were performed in 55 patients without fluoroscopic aid and improvement of dysphagia was achieved in all patients. Another similar study was conducted on ten patients of corrosive esophageal stricture at Dr. DY Patil Medical College Hospital and Research Centre, India.¹⁸ Four patients had single site stricture and six patients had multiple site strictures. Over a period of 12 months, 180 dilations were performed on these 10 patients of corrosive strictures without using fluoroscopic aid. Significant relief in dysphagia was achieved in 8 patients, while treatment failure was noted in 2 patients. Minor perforation was seen only in one patient. Similar studies by Fleischer et al¹⁹ and Kadakia et al²⁰ also showed that that dilatation of benign esophageal strictures with Savary Guilliard dilators without using fluoroscopic aid is safe and effective.

Conclusion

Our study showed that dilatation of corrosive esophageal strictures with Savary-Guilliard dilators is safe and effective method without the need of fluoroscopic monitoring.

*Department of Gastroenterology Medicine
SIMS/Services Hospital, Lahore
www.esculapio.pk*

References

1. Siersema PD. Treatment options for esophageal strictures. *Nature Clinical Practice Gastroenterology & Hepatology*. 2008 Mar 1;5(3):142-52.
2. Lew RJ, Kochman ML. A review of endoscopic methods of esophageal dilation. *Journal of clinical gastroenterology*. 2002 Aug 1;35(2):117-26.
3. Kabbaj N, Salihoun M, Chaoui Z, Acharki M, Amrani N. Safety and outcome using endoscopic dilatation for benign esophageal stricture without fluoroscopy. *World journal of gastrointestinal pharmacology and therapeutics*. 2011 Dec 6;2(6):46.
4. Salihoun M, Kabbaj N, Raissouni F, Chaoui Z, Mohamed A, Naima A. Safety and Effectiveness of Endoscopic Savary-Gillaard Bougies Dilatation in Moroccan Plummer-Vinson Syndrome Patients. *ISRN Endoscopy*. 2012 Oct 31;2013.
5. Park KS. Evaluation and management of caustic injuries from ingestion of acid or alkaline substances. *Clinical endoscopy*. 2014 Jul;47(4):301.
6. Kluger Y, Ishay OB, Sartelli M, Katz A, Ansaloni L, Gomez CA, Biffi W, Catena F, Fraga GP, Di Saverio S, Goran A. Caustic ingestion management: world society of emergency surgery preliminary survey of expert opinion. *World journal of emergency surgery*. 2015 Dec;10(1):48.
7. Lupa M, Magne J, Guarisco JL, Amedee R. Update on the diagnosis and treatment of caustic ingestion. *Ochsner Journal*. 2009 Jun 20;9(2):54-9.
8. Contini S, Scarpignato C. Caustic injury of the upper gastrointestinal tract: a comprehensive review. *World journal of gastroenterology: WJG*. 2013 Jul 7;19(25):3918.
9. Wilsey MJ, Scheimann A, Gilger MA. The role of upper gastrointestinal endoscopy in the diagnosis and treatment of caustic ingestion, esophageal strictures, and achalasia in children. *Gastrointestinal Endoscopy Clinics*. 2001 Oct 1;11(4):767-87.
10. Pereira-Lima JC, Ramires RP, Zamin I, Cassal AP, Marroni CA, Mattos AA. Endoscopic dilation of benign esophageal strictures: report on 1043 procedures. *The American journal of gastroenterology*. 1999 Jun 1;94(6):1497-501.
11. Mamede RC, Mello Filho FV. Ingestion of caustic substances and its complications. *Sao Paulo Medical Journal*. 2001 Jan;119(1):10-5.
12. Adedeji TO, Tobih JE, Olaosun AO, Sogebi OA. Corrosive oesophageal injuries: a preventable menace. *Pan African Medical Journal*. 2013;15(1).
13. Katz A, Kluger Y. Caustic material ingestion injuries-paradigm shift in diagnosis and treatment. *Health Care Curr Rev*. 2015;3:1-4.
14. Gupta V, Wig JD, Kochhar R, Sinha SK, Nagi B, Doley RP, Gupta R, Yadav TD. Surgical management of gastric cicatrization resulting from corrosive ingestion. *International Journal of Surgery*. 2009 Jan 1;7(3):257-61.
15. Zargar SA, Kochhar R, Nagi B, Mehta S, Mehta SK. Ingestion of strong corrosive alkalis: spectrum of injury to upper gastrointestinal tract and natural history. *American Journal of Gastroenterology*. 1992 Mar 1;87(3).
16. Sami SS, Haboubi HN, Ang Y, Boger P, Bhandari P, De Caestecker J, Griffiths H, Haidry R, Laasch HU, Patel P, Paterson S. UK guidelines on oesophageal dilatation in clinical practice. *Gut*. 2018 Jun 1;67(6):1000-23.
17. Wang YG, Tio TL, Soehendra N. Endoscopic dilation of esophageal stricture without fluoroscopy is safe and effective. *World journal of gastroenterology*. 2002 Aug 15;8(4):766.
18. Bhatt VR, Kakrani AL. A clinical study of the use of savary-gillaard dilators in corrosive esophageal strictures without the use of fluoroscopy: A reality in resource-limited settings in a developing country. *Journal of Digestive Endoscopy*. 2018 Oct 1;9(4):159.
19. Fleischer DE, Benjamin SB, Cattau Jr EL, Collen MJ, Lewis JH, Jaffe MH, Zeman RK. A marked guide wire facilitates esophageal dilatation. *American Journal of Gastroenterology*. 1989 Apr 1;84(4).
20. Kadakia SC, Cohan CF, Starnes EC. Esophageal dilation with polyvinyl bougies using a guidewire with markings without the aid of fluoroscopy. *Gastrointestinal endoscopy*. 1991 Mar 1;37(2):183-7.