

A Prospective Study of Management of 100 Cases of Post Acid Ingestion Oesophageal Stricture with Dilatation

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Abstract

Context: study of management of post acid ingestion oesophageal stricture by dilatation. **Aims:** By studying 100 cases of post acid ingestion stricture to decide effectiveness of dilatation as a alternative of treatment as for transposition or replacement. **Settings and Design:** This prospective clinical study was carried out on patient of 100 cases diagnose as a Oesophageal stricture due to corrosive ingestion. **Methods and Material:** This prospective clinical study was carried out on patient of 100 cases diagnose as a Oesophageal stricture due to corrosive ingestion who are b/w 2 to 70 years, having Post acid ingestion oesophageal stricture patient require surgical (intervention) will be included & who haven't pre-existence oesophageal problems (stricture, Ca, motility disorders etc.), not having congenital TE anomalies, altered renal function & other comorbidities including (DM, HTN & other medical comorbidities). **Result:** out of 100 cases of post acid ingestion Grade II b injuries were present in 32% (most common) of patients. 85 patients were treated with oesophageal dilatation. **Statistical analysis used:** Efficacy of conventional measure & criteria & outcome compared with criteria & results of present study to correlate with outcomes percentage of outcome of study were used & were considered success when outcome percentage were better. **Data entry and analysis:** Data entry and analysis was done in Microsoft excel and frequency distribution and proportion were calculated for variable in the study. **Results:** Out of 100 patients of post acid ingestion oesophagus with grad IIB and selected grade III treated

with dilatation with guide wire and bougie dilator most of patients required repeated dilatation of average 4 dilatation at an interval of 1 month with complication of haemorrhage in 10% and hypoxia intra-op in 6% of patients and morbidity of oesophageal perforation in only one patient with null mortality noted. **Discussion:** Out of 100 patients of post acid ingestion oesophagus with grad IIB [4] and selected grade III treated with dilatation with guide wire and bougie dilator most of patients required repeated dilatation of average 6 dilatation at an different interval depending upon severity an length of injury to oesophagus by acid, with complication of haemorrhage in as many 10% of patients which was mild and managed with withholding procedure and NG tube insertion, other most common complication was hypoxia due to associated laryngeal injury which is most common associated morbidity also with 32% patients having laryngeal injury, with 1% morbidity due to rupture oesophagus and required urgent surgery, ICD insertion. Which later treated with colonic transposition with no mortality were documented with this study. Flexible fibre optic endoscopy made the assessment of upper gastrointestinal injuries accurate, safe, and reliable & practicable. Injury were graded according to modified Zargar et al classification [11], Dilatation is possible (usually 1 to 2 months) after injury, and were done with guide wire and bougie dilator set after minimum period of 6 weeks as per criteria for intervention in post acid ingestion injury. The endoscope and over the wire dilatation technique for Oesophageal dilatation is most common, Less invasive, preferred 1st line management for less severe injury up to grade IIB and selected grade III although repeated dilatations are required in almost all patients to prevent recurrence at different intervals depending upon, concentration, amount, complaints, severity, availability of sources. Oesophageal dilation is the most common Modality, on-invasive, preferred,

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first line of management when possible up to grade 3 injury in selected patients. Certainly good nutrition and careful peri-operation treatment are important for the healing process. *Conclusions:* Dilatation relatively safe, acceptable, easy, noncomplex procedure for treatment of post acid ingestion oesophageal stricture management for grade II and selected grade III patients with acceptable complications and no mortality.

Keywords: Post Acid Ingestion; Oesophageal Stricture; Endoscopic Oesophageal Dilatation.

Introduction

Ingestion of corrosive agents is not an uncommon cause of benign strictures of the upper aero digestive tract in India. Easy availability of hydrochloric acid [5] in the form of a cheap toilet cleaner is a frequent cause of acid poisoning leading to pyloric and antral strictures. There are only few reports published highlighting the management of corrosive stricture of oesophagus and antrum of the stomach in children [1]. Burns from ingestion of such agents may include the oral, pharynx, larynx, oesophagus and stomach. Many different therapies have been recommended. Repeated dilations to maintain an adequate lumen diameter were given in patients with chronic strictures. As for to decide effectiveness of the dilation, depending on length of stricture in more severe strictures, the objective of this study was to analyse a 100 patients treated in our hospital who ingested caustic substances, and to assess the effectiveness of endoscopic oesophageal dilatation administered in patients with strictures after caustic injury in oesophagus.

Materials & Methods

Study Design & Settings: This prospective clinical study was carried out on patient of 100 cases diagnose as an Oesophageal stricture due to corrosive ingestion.

Study Period: 3 years.

Sample size, Sample design and selection of patients: Total 100 cases of post corrosive ingestion oesophageal stricture were enrolled in the study. Patients were selected randomly.

Data collection tool: Data collection tool include socio-demographic variable, clinical variable, inclusion criteria, exclusion criteria and variable depending on follow up of the patient.

Ethical issue: Informed and written consent was taken from patient after explaining them study. The patient, who giving informed-written consent were included in study. Permission for conducting study was taken from the Institutional Review Board of our institute.

Inclusion Criteria

Post acid ingestion oesophageal stricture patient were be included.

Patient b/w 2 to 72 years were included.

Patient require surgical or (intervention) or medical management will be included.

Patient can afford and continue study will be included.

Exclusion Criteria

Patient <2 & 72> of age patient not willing.

Patient managed without intervention (discharged on OPD bases).

Patients not want to continue.

Patient having pre-existence oesophageal problems (stricture, Ca, motility disorders etc.).

Patient having congenital TE anomalies.

Patient having altered renal function & other comorbidities including (DM, HTN & other medical comorbidities).

Outcome Measurement: Efficacy of conventional measure & criteria & outcome compared with criteria & results of present study to correlate with outcomes percentage of outcome of study were used & were considered success when outcome percentage were better.

Data Entry and Aanalysis: Data entry and analysis was done in Microsoft excel and frequency distribution and proportion were calculated for variable in the study.

Follow up Schedule: patients were follow up on 1 week, 2 week, 4 weeks, 2 months, 3 months after surgery & were assessed for outcome. Post-operative complications were also counted.

Procedure: patients were followed regarding predefined protocols for managements include *early history & general (clinical examination)* [6,8] & management of a patient of post acid ingestion oesophageal stricture (*primary or early:* History includes age, sex, type of substance: Acid/ Alkali, Mode of ingestion: Accidental or Suicidal, Quantity: in cc, Diluted or not, Past history, anyhospitalization General examination: including adequacy of the patient's airway *Abdomen:* Pain, distension, tenderness, rigidity, guarding in c/o perforation or peritonitis [13,14].

Management

First aid (primary) (1) Identify the swallowed toxic agents if possible (acid or alkali), The use of emetics: reexposes [14] mucosa of oesophagus to corrosives and contraindicated, (2) Neutralizing Agents: causes thermal injury to upper GI mucosa (3), Gastric lavage: lead to perforation, better avoided Transfer to hospital immediately, Keep NPO, Insert NG tube IF possible: R/ O perforation, Plain films of chest and abdomen.

Specific

Upper GI scopy: No later than 48 hours, usually avoided from 1-21 days

Grading, (upper GI): MODIFIED Zargar's endoscopic grading [11]

Grade 1: Edema and hyperemia of the mucosa,

Grade 2a: Superficial ulceration, erosions, friability, blisters, exudates, haemorrhages, whitish membranes,

Grade 2b: Grade 2a plus deep discrete or circumferential ulcerations,

Grade 3a: Small scattered areas of multiple ulceration and areas of necrosis with brown black or greyish discoloration,

Grade 3b: Extensive necrosis

Grade 4 : Perforation

Oesophageal Dilatation

Two separate studies THYOKA ET AL'S [15] and Uygun et al's [16] were compared for safe balloon dilatation.

Kozarek study showed only one perforation in 400 dilation [19]

Both balloon and bougie dilators were effective [18]

General rules of oesophageal dilatation

Fluoroscopy used to guide blind passage of a guide wire

Rule of 3: The first bougie passed should be approximately equal to the estimated diameter of the stricture. Pass no more than 3 consecutive bougies of progressively increasing size after one that meets moderate resistance during any one dilatation session, this rule was formed during dilatation using mercury filled bougie resulting in dilation of no more than 1.3mm in one session. However, polyvinyl dilators may not provide adequate tactile perception to follow this rule.

Balloon dilators frequently dilate greater than prescribed by rule of 3s without any increased risk of complications.

No consensus exists regarding the end point of oesophageal dilatation for peptic strictures.

Most patients get complete relief when dilated to 40-45 F. There for, using this end point as a bench mark is recommended.

Extent of dilatation should be individualize based on symptomatic response and technical difficulty encountered during therapy

Simple dilators (Bougies): These are a series of flexible dilators of increasing thickness.

Guided Wire Bougies: In some instances, the physician performs endoscopy and places a flexible wire across the stricture. One or more of these dilators are passed

over the wire. At the end of it, the wire is removed. This type of treatment may be performed in the x-ray department under fluoroscopy.

Balloon dilators Flexible endoscopy allows the physician to directly view the stricture. Deflated balloons are placed through the endoscope and across the stricture. When inflated, they become sausage shaped, stretch, and break the stricture. Of which we used guide wire bougie dilator for our study. Patients were examined at 6 weeks after acid ingestion and patients with stricture dilated with guide wire bougies and followed up at 1 week, 2 week, 4week, 2 months, and 3 months after and dilated repeatedly as and when required.

Post-operative care: The appropriate selection of surgical procedure, its meticulous execution, and perioperative care have causal relationship with morbidity and mortality. Oral intake is usually continued for the first 1 to 2days after surgery, post-operative antibiotic, NPO, DVT prophylaxis, nutrition, hydration, vitals, cardiac and respiratory monitoring.

Post-Operative Complications

Early: haemorrhage, hypotension, pneumothorax,

Late: mediastinitis, recurrent stricture, DVT, pulmonary embolism, pneumonia of which post op recurrent stricture is commonest for which multiple oesophageal dilatation is done in all patients at different frequency.

Results

The study includes 100 cases of post acid ingestion oesophageal stricture who met the pre decided inclusion criteria & were managed for post acid ingestion oesophageal stricture.

Adult age (20-40) most commonly affected in this study. Incidence of oesophageal stricture in Age group 0-20 years 12 (12%), 20-40 years (68%), 40-60 years 16 (16%), 60-80 years 4 (4%). mean age group being 23-25. which compared to Shivkumar et al & Dilwarkar et al study is 23.44 & 28.034 respectively [19,20,21] (Table 1).

Acid ingestion is more common in Female sex in a study of 25 cases (64%). (Table 2).

Incidence of oesophageal stricture due to suicidal attempt (more common) 88 (88%), Accidental 12 (12%), Homicidal 0 (0%). In study by Shiva Kumar et al 88.6% ingested with suicidal intension (9) (Table 2).

Patients presented between three to 6 months after post acid ingestion with, 2 patients after 3 weeks, 10 patients after 6 weeks, 14 patients after 8 weeks, 64 patients after 10 weeks, 5 patients after 16 weeks and 5 patients after 6 months of post acid ingestion (Table 3).

Out of 100 patients of post acid ingestion oesophagus with grad IIB and selected grade III treated with dilatation with guide wire, most of patients required repeated dilatation of average 6 dilatation at an interval of 15 days, 1, 3 & 6 months with complication of haemorrhage in 10% and hypoxia intraop in 6% of patients and morbidity of oesophageal perforation in only one patient with null mortality noted. (Table 4 & 5).

Discussion

Incidence of oesophageal stricture in Age group 0-20 years 12 (12%), 20-40 years (68%), 40-60 years 16 (16%), 60-80 years 4 (4%). mean age group being 23-25. which compared to Shivkumar et al & Dilwarkar et al study is 23.44 & 28.034 respectively [19,20,21]. Out of 100 patients of post acid ingestion oesophagus with grade IIB and selected grade III (based on endoscopic clinical finding which can be tried for endoscopic dilatation who are high risk for surgery and dilatation could be better option if possible.) (grades on bases of modified zargar scoring) falling

Table 1: Age wise distribution of patients

Age Group	No of Patients (Percentage)
0-20	12(12%)
20-40	68(68%)
40-60	16(16%)
60-80	4(4%)

Table 2: Gender wise distribution of patients

	Present Study No of Patients (Percentage)	Shivkumar No of Patients (Percentage)	Dilwarkar No of Patients (Percentage)
Male	36(36%)	22(44%)	18(36%)
Female	64(64%)	28(56%)	32(64%)

Table 3: Distribution of Patients according to mode of ingestion

Mode of ingestion	No of Patients (Percentage)
Suicidal	88(88%)
Accidental	12(12%)
Homicidal	0 (0%)

Table 4: Distribution of Patients according to Upper GI Grade of Stricture

Grade of Upper GI Scopy	No of Patients (Percentage)
0	0(0%)
1	0(0%)
2A	20(20%)
2B	32(32%)
3A	12(12%)
3B	28(28%)
4	8(8%)

Table 5: Distribution of Patients according to mortality and management

Management	No. of Patients (Percentage)	Complication	Morbidity	Mortality
Dilatation	100	16(16%)	1(1%)	0(0%)

in inclusion criteria treated with dilatation with guide wire and bougie dilator up to 40Fr and it took average 6 sessions depending up on severity and length of injury to oesophageal mucosa to get dilatation up to 40 Fr, most of patients required repeated dilatationsessions of average 6 dilatation sessions at an interval of 15 days then 1 month, 3 month and 6 months due to recurrent stricture after dilation. And patients were followed up for 6 months after admission at 1 month, 3 months, 5 months and 6 months, every patient was followed up for 6 months with complication of haemorrhage in as many 10% of patients which was mild and managed with withholding procedure and NG tube insertion, Other most common complication was hypoxia due to associated laryngeal injury which is most common associated morbidity also with 32% patients having laryngeal injury, with 1% morbidity due to rupture oesophagus and required urgent surgery, ICD insertion. Which later treated with colonic transposition with no mortality were documented with this study. Grade II a injuries were present in 20% of patients, Grade II b injuries were present in 32% (most common) of patients, Grade III a injuries were present in 12% of patients, Grade III b injuries were present in 28% of patients, Grade IV injuries were present in 8% of patients where 46.2% grade III injuries were present in study by Shiva Kumar et al. Grade III a injuries & III b injuries were present in 16% & 14% of patients, where 46.2% grade III injuries were present in study by Shiva Kumar et. Flexible fibre optic endoscopy made the assessment of upper gastrointestinal injuries accurate, safe, and reliable & practicable. Injury were graded according to modified Zargar et al classification, Dilatation is possible (usually 3months) after injury, and were done with guide wire set after minimum period of 6 weeks as per criteria for intervention in post acid ingestion injury. The endoscope and over the wire dilatation technique for Oesophageal dilatation is most common, Less invasive, preferred 1st line management for less severe injury up to grade IIB and selected grade III although repeated dilatations are required in almost all patients to prevent recurrence at different intervals depending upon, concentration, amount, complaints, severity, availability of sources [5]. Oesophageal dilation is the most common Modality, non-invasive, preferred, first line of management when possible up to grade 3 injury in selected patients Certainly good nutrition and careful peri-operation treatment are important for the healing process. Oesophagectomy [10,11] required for rest cases.

Conclusion

From this prospective study of 100 cases of post acid ingestion for post acid ingestion oesophageal stricture it is concluded that most common cause for acid ingestion is HCL (sanitary cleansing agent) with more common in female sex and young age group with most common mode is suicidal. if patient present early (1st 6 hours naso-gastric tube insertion can be helpful to prevent future stenosis and upper GI study also possible with less risk of perforation and when present later (after 24hours) it is advisable to wait minimum 6 weeks for upper GI scopy. Dilatation relatively safe, acceptable, easy, noncomplex, noncumbersome with minimal morbidity and no mortality whenever possible.(up to grade IIB and selected (high risk of surgery) grade III).

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