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Case Series

In era of gold standard laparoscopic surgery, a study profile of open Nissen's fundoplication for drug refractory endoscopically diagnosed and manometrically confirmed hiatus hernia in a tertiary care hospital

Ajinkya H. Akre*, Santosh D. Thorat, Mayur Baviskar, Diksha V. Katare

Department of General Surgery, Pimpri Chinchwad Municipal Corporations, Post Graduate Institute, Yashwantrao Chavan Memorial Hospital Pimpri, Pune, Maharashtra, India

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***Correspondence:**
Dr. Ajinkya H. Akre,
E-mail: ajinkya.akre@gmail.com

ABSTRACT

Hiatus hernia is a condition in which part of the stomach protrudes into the chest cavity through the esophageal hiatus, a hole in the diaphragm. The condition is often asymptomatic but can cause gastroesophageal reflux disease (GERD), dysphagia, chest pain, and other complications in some cases. The diagnosis of hiatus hernia is typically made using imaging tests such as endoscopy or radiography and confirmation done using esophageal motility studies. Management of hiatus hernia depends on the severity and symptoms of the condition. Mild cases may be managed with lifestyle modifications such as weight loss, dietary changes, and avoiding certain trigger foods. Medications such as proton pump inhibitors (PPIs) and histamine receptor antagonists may also be used to control GERD symptoms in maximum number of cases. Surgical intervention will be necessary for more severe cases or cases that do not respond to conservative management. The two main types of surgery for hiatus hernia are conventional/open Nissen fundoplication and laparoscopic fundoplication. These procedures aim to strengthen the lower esophageal sphincter and prevent stomach acid from flowing back into the esophagus. Overall, the management of hiatus hernia requires a multidisciplinary approach involving gastroenterologists, surgeons, and primary care providers. The optimal management will be an individualized approach addressing severity of symptoms and responses to drugs. This study aims to review the drug refractory cases of hiatus hernia in a select group of adult patients not eligible for standard laparoscopic approach diagnosed endoscopically and managed by open Nissen's fundoplication.

Keywords: Hiatus hernia, Nissens fundoplication, Laparoscopic surgery

INTRODUCTION

A hiatal hernia or hiatus hernia is a type of hernia in which abdominal organs typically stomach slip through the diaphragm into the middle compartment of the chest.[1]

It is a common disorder that causes any abdominal structure other than the oesophagus to protrude into the thoracic cavity through a widening of the diaphragm's hiatus, which causes reflux.[2,3] Some people with hiatal hernias do not experience any reflux symptoms while others experience heartburn, abdominal discomfort, throat irritation, belching, and regurgitation.

GERD is a widespread chronic condition that is predominantly prevalent in western nations.[4] In accordance with published studies, GERD is less common and has a milder spectrum in the Asian populace.[5] A systematic analysis demonstrated that the prevalence of GERD ranged from 10 to 20% in western countries, while it was only 5% in Asia.[6] According to some reports, the prevalence of GERD has been rising

over past 2 decades, and reflux disease may be more widespread in Asian nations than previously thought.[7,8]

Weakness in phrenoesphageal ligament may lead to cephalad migration of gastroesophageal junction. Gastroesophageal junction is displaced proximally and ligament is stretched as result of loss of elastin fibres.[9] Although familial clustering has been documented and in very small no. of cases, multifactorial inheritance may be involved, majority of cases of hiatal hernia are acquired rather than congenital.[10] In patients who have more than 8 years of life expectancy and are in need of lifelong therapy because of mechanically defective LES, surgical therapy may be considered treatment of choice.[11-13] Anti-reflux surgery is well-established procedure known to be safe and effective for GERD management.

Etiology of hiatus hernia is shown below in Figure 1.

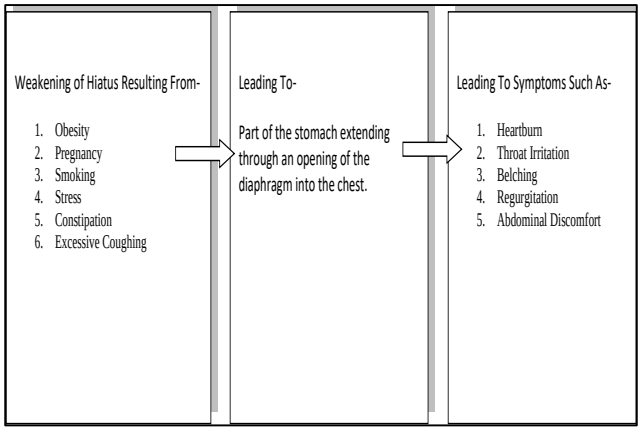

Figure 1: Etiology of hiatus hernia.

Diagrammatic representation of hiatus hernia (Figure 2).

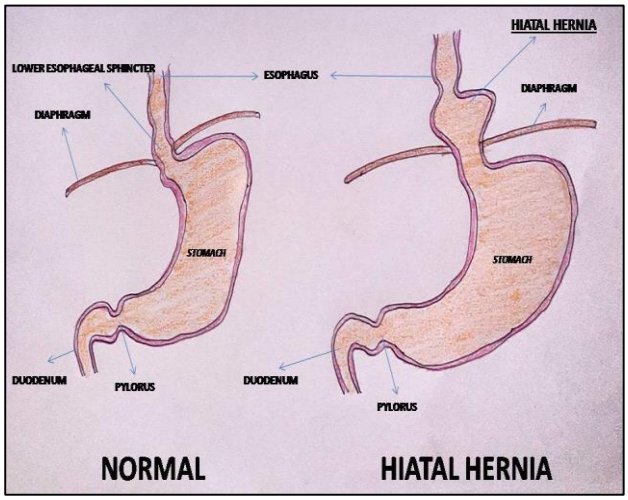

Figure 2: Diagrammatic representation of hiatus hernia.

Studies have established the substantial correlation between GERD and the risk of oesophageal adenocarcinoma, and anti reflux surgery has been regarded to be the best option for symptom relief and esophageal mucosal healing.[14] A number of similar illnesses' aetiologias have been linked to GERD.[15]

The treatment was originally used by Dr. Rudolph Nissen in 1955, and the outcomes of two instances were published in a Swiss medical weekly in 1956.[16] The Nissen fundoplication strengthens the LES by raising LES pressure and LES length to minimize reflux.[17]

While having a similar risk for adverse events, fundoplication was found to be more effective than PPI therapy at raising LES pressure.[18] Surgery was found to be more effective than PPIs alone at controlling symptoms in patients with non-acid reflux, hiatal hernia, or respiratory symptoms.[19] Studies revealed that the Nissen fundoplication (NF) results in GERD patients are satisfactory when compared to medical treatment.

Surgical care continues to be the only long-term treatment for hiatus hernia in the modern era and in nations like India where patients are medically and economically underprivileged.

For patients who are surgically and medically not suitable to have laparoscopic surgery, open Nissen's fundoplication serves as a pillar of stability in the modern laparoscopic age.

The following are the most typical reasons why Nissen's fundoplications fail:[20] Post op dysphagia, recurrent reflux, wrap migration into the chest, disruption of the hiatal repair, telescoping

The current classification scheme defines 4 types of hiatal or oesophageal hernias (PEHS) are listed next.[21]

Type 1

Sliding hiatal hernia (90%) when gastro oesophageal junction is not maintained intraabdominally by phrenooesophageal ligament and herniates into mediastinum.

Type 2

Rolling hernias (Paraoesophageal hernia)-when GEJ is anchored in abdomen but hiatal defect is large enough to allow herniation of viscera into the mediastinum.

Type 3

Mixed hernias (combination of both the above).

Type 4

Herniation of colon and spleen. Diagrammatic representation is shown below in Figure 3 and 4.

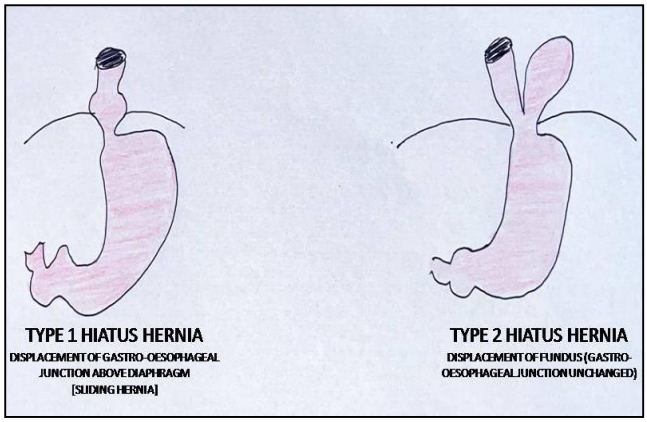

Figure 3: Diagrammatic representation of type 1 and type 2 hiatus hernia.

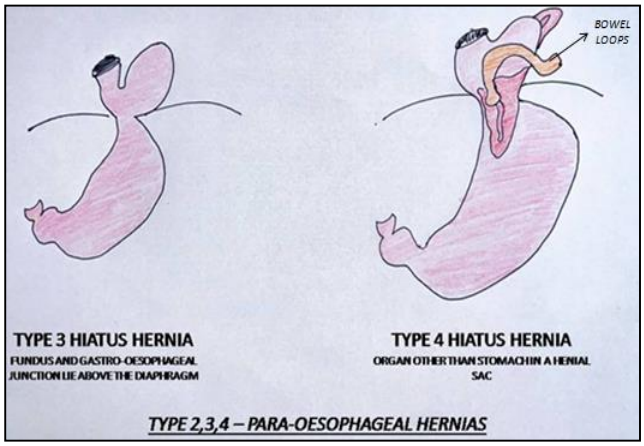

Figure 4: Diagrammatic representation of type 3 and type 4 hiatus hernia.

Hill et al offered a useful classification in 1996 to enable more accurate evaluation of the esophagogastric sphincter mechanism's capability. Inverted inspection by endoscope is used to classify the gastroesophageal flap valve into one of four groups.[22]

Hill grade I: An obvious tissue fold adjacent to the endoscope along the smaller curvature. Endoscopic image of Hills grade 1 is shown in Figure 5.

Figure 5: Endoscopic image depicting hills grade 1 hiatus hernia.

Hill grade II: The fold is less noticeable, and the area around the endoscope experiences brief openings and swift closures.

Endoscopic image of Hills grade 2 is shown in the Figure 6.

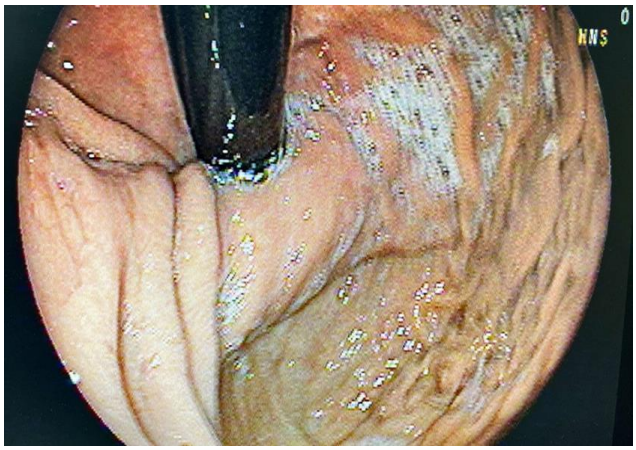

Figure 6: Endoscopic image depicting hills grade 2 hiatus hernia.

Hill grade III: The fold is not prominent and the endoscope is not tightly gripped by the tissue.

Endoscopic image of Hills grade 3 is shown in the Figure 7.

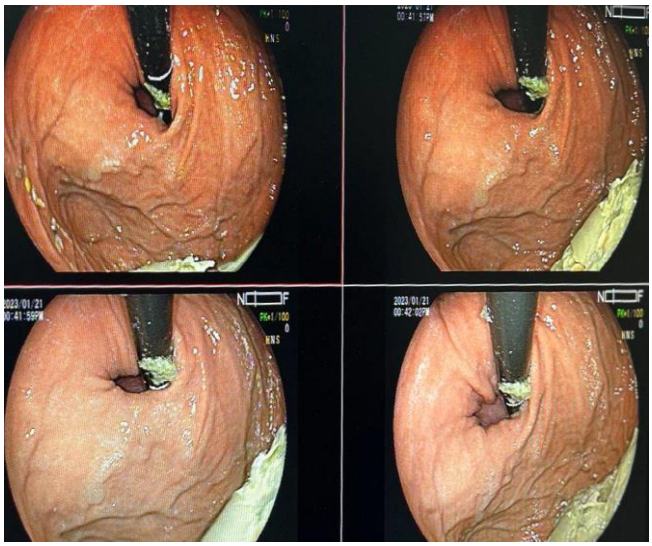

Figure 7: Endoscopic image depicting hills grade 3 hiatus hernia.

Hill grade IV: There is no fold, and the lumen of the esophagus is open, often allowing the squamous epithelium to be viewed from below. A hiatal hernia is always present.

Endoscopic image of Hills grade 4 is shown in the Figure 8.

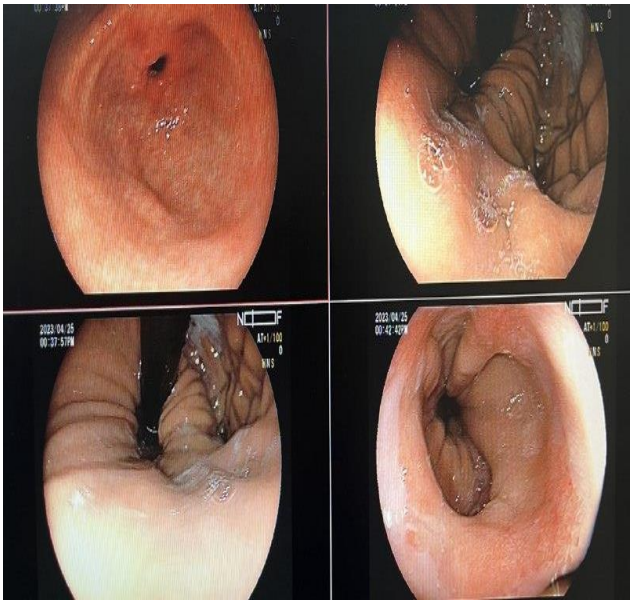

Figure 8: Endoscopic image depicting hills grade 4 hiatus hernia.

Endoscopically hiatus hernia occurs as a pouch lined by folds of stomach mucosal rugae which lies 2 cm or greater above the crura margins of the diaphragm.

The J maneuver helps evaluate the full circumference of the mucosal lining of the herniated stomach.

CASE SERIES

This was a study, conducted at tertiary care hospital on 24 patients with endoscopically diagnosed hiatus hernia grade 2, 3 and 4.

Duration of study was from November 2020 to April 2022

The complete treatment takes approximately 2:30-3 hours. The average hospital stay was 4-5 days, and patients were usually able to resume normal activities within one month. The patients were now able to lie flat in bed, discontinue all reflux medications, and enjoy late-night meals, among other things that they were unable to do previously.

The results were documented in the form of discontinuation of all antireflux medications and lifestyle changes such as being able to eat late at night without regurgitation even when lying supine in bed.

The disease-free time was noted at two weeks, three months, and one year follow up after surgery.

Efficacy of anti-reflux surgery was objectively evaluated by doing upper gastrointestinal endoscopy at above periods, the results of which are documented in this study.

Modified Nissen's fundoplication consisted

Posterior window in oesophagus by omentum dissection, dissection of the hiatus, carefully preserving vagus nerves both anterior and posterior, anterior fundoplication 360 degree, anchoring the oesophagus to the diaphragmatic crura with two non-absorbable stitches on either side of the modified Nissen's fundoplication, the oesophagus was kept under downward traction to maintain an esophageal length in the abdomen of at least 5 cm, the anti-reflux wrap was made with three sutures that were about 3 cm long, using two non-absorbable stitches on each side to secure the oesophagus to the diaphragmatic crura and the anti-reflux wrap was made with three sutures that were roughly 3 cm long.

Symptoms and post-op relief was calculated on basis of De-Meester Johnson reflux score given in Table 1.

Table 1: De-Meesters Johnson reflux score.

Score	Heartburn	Regurgitation	Dysphagia
0	None	none	None
1	Recognizable symptoms, no history of medications	Large meals, lying down	With coarse food
2	Primary reason for hospital visit	Predictable on lying down	Requires liquid to clear
3	Disability in doing daily activity	Aspiration	Meat impaction

Demographic details with chief complaints and operative findings of patients are given in Table 2.

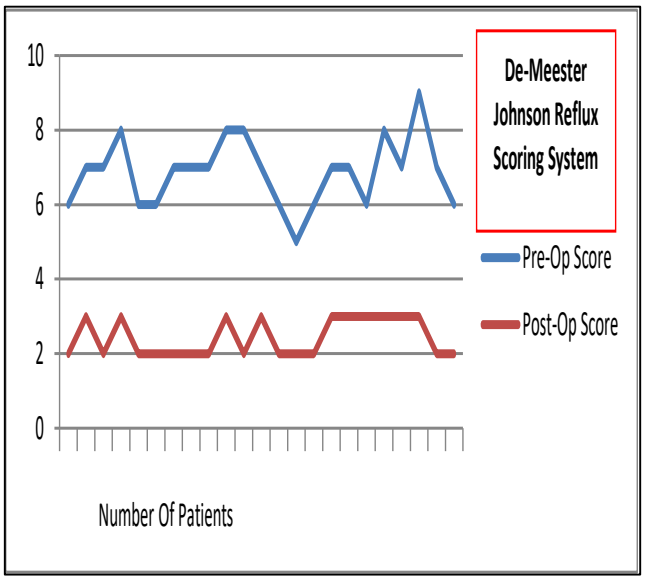

Figure 9: Comparison between pre-operative and post-operative symptoms by De-Meester Johnson reflux scoring system.

Table 2: Demographic details with chief complaints of patients presenting to OPD and pre-operative and intra-operative findings.

Variables	Males (%)	Females (%)
Population in the study group	62.5	37.5
Age-wise distribution (In years)		
29-38	12.5	4.1
39-48	16.6	-
49-58	20.8	12.5
59-68	8.3	16.6
69-78	4.1	4.1
Occupation		
Knowledge workers- lecturers, writers, architects, judges, engineers, scientists etc.	4.1	-
Data workers-sales, pharmacists, teachers, inspectors, advertising agents etc.	12.5	20.8
Service workers-Waiters, hairdressers, cleaning, policemen, service, stewards etc.	20.8	12.5
Goods workers-Painters, drivers, electricians, machinists etc.	25	4.1
Addictions and co-morbidities (Not mutually exclusive)		
Obesity	33.3	25
Known case of-Renal-disease, liver disease, tuberculosis, asthma, COPD, diabetes mellitus etc.	37.5	29.1
Addictions-Alcohol, smoking etc.	29.1	-
Chief complaints-not mutually exclusive		
Chest pain	33.3	26.6
Dyspepsia	60	66.6
Heartburn	40	44.4
Endoscopic grading by Hills classification		
II	16.6	8.3
III	29.1	12.5
IV	16	16.6
Time of surgery (In hours)		
2-2.4	12.5	4.1
2.5-2.9	20.8	16.6
3.0-3.4	29.1	8.3
Intra-operative bleeding (ml)		
50 to 100	20.8	20
>100 to 150	29.1	16.6
>150 to 250	12.5	-

DISCUSSION

On endoscopy and barium swallow, all 24 patients identified with hiatus hernia and treated with open modified Nissen's fundoplication.

Study was conducted over an 18-month period on both males and females ranging in age from 25 to 70 years.

All patients were workers by occupation with stressful lifestyles and addictions such as alcohol consumption and tobacco use in the form of smoking or chewing.

All patients presented with major chief complaints of heart burn, dyspepsia, and chest pain.

All these patients were under medical treatment in the form of PPIs for a duration of more than 1 year with no relief of their symptoms.

Cases had grade II, III and IV hiatus hernias.

Time required for surgery ranged from approximately 2 to 3.5 hours, intraoperative hemorrhage was determined to be modest, ranging from 50 to 120 ml.

The post-operative hospital stay was 4-5 days.

Oral feeding was resumed on an average 2nd to 3rd post operative day once ileus settled on clinical examination and on evidence of bowel sounds.

Patients were mobilized out of bed on days 1st day following surgery.

There was no mortality or perioperative complications, and the patients recovered well on expectant post operative protocol using guidelines of ERS.

The patients' symptoms improved significantly, with just two patients experiencing post-operative problems, notably hiccups and abdominal pain, which were both treated conservatively in the form of anti-emetic medications

One patient had severe dyspepsia, while another had dysphagia that required medical attention.

Postoperative esophageal acid exposure, reflux number, and symptom-reflux association all decreased markedly confirmed on doing post-operative manometry studies.

The lower esophageal sphincter (LES) abdominal length increased postoperatively due to adequate mobilization of esophagus as confirmed by post-operative esophageal manometry.

Two patients experienced post-operative nausea and vomiting (PONV) for three days, which was treated conservatively with antiemetics. Among these two, one patient developed hiccups that lasted 5 days, were aggravated when lying down, and were managed conservatively.

CONCLUSION

Even in the era of gold standard laparoscopic Nissen's fundoplication as a preferred and less morbid procedure for lifestyle-related complications of hiatus hernia, open surgery is still used in patients where laparoscopic surgery is not possible. Nissen's fundoplication is an alternative for people who are both financially disadvantaged anaesthetically poor candidates owing to anti-secretory drugs. The patients unfit for laparoscopy had comorbidities such as: Obesity, COPD, old cerebrovascular accident and renal and liver disease. Patients from low socioeconomic backgrounds cannot afford the expense of prescriptions over the course of their lives and eventually develop refractory to therapies. The cost of laparoscopic surgery, as well as drug-associated problems and issues related to the herniated section of the gastroesophageal junction ranging from oesophagitis to Barretts oesophagus to oesophageal malignancy, operate as impediments. As a result, open surgery has proven to be beneficial and is still preferred in these select group of patients who are refractory to medical line of treatment.

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