

# INTRATHORACIC STOMACH EVALUATION AND SURGICAL MANAGEMENT

By

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Between January 1988 and January 1999 all patients with intrathoracic stomach presenting to our practice were reviewed. The different ways of presentation and the different investigations which determined diagnosis were discussed. The risk of volvulus and the effectiveness of surgical repair were evaluated.

### INTRODUCTION

Hernias of the oesophageal hiatus are the most common abnormality of the upper gastrointestinal tract, occurring in approximately 10% of the population<sup>(1)</sup>. Most are sliding hiatal hernias in which the herniated stomach makes up part of the wall of the accomanying hernial sac. Less frequent are para-oesophageal hernias where the gastro-oesophageal junction remains below the diaphragm but the fundus and successively larger portions of the greater curvature herniates through the hiatus along side the oesophagus into the thorax. Intrathoracic upside-down stomach is a term applied where most of the stomach is displaced in an inverted position displaying characteristics of both sliding and para-oesophageal hernias<sup>(2&3)</sup>. Several publications reported that most of the massive intrathoracic stomachs are pure para-oesophageal hernias<sup>(2)</sup>. In this small work, a retrospective study was carried out where we reviewed all patients with intrathoracic stomach presenting to our practice between 1988-1999 to elucidate the different ways of presentation, to study the anatomical defect (whether pure para-oesphageal or mixed) and to determine both the risk of volvulus and the effectiveness of surgical repair.

## **MATERIAL & METHODS**

Between January 1988 and January 1999 a total of 37 patients with intrathoracic stomach presented to our

practice. At least 75% of their stomach was located above the diaphragm. The records of these 37 patients were analysed for presenting symptoms and signs (Table 1), duration of symptoms, pre-operative investigations, type of surgical repair (Tabel 2), post-operative complications and long term out come.

All our patients were explored through an upper midline incision. The repair was carried out abdominally in all patients except for two cases. Gentle traction on the distal stomach with fingers delivering the herniated portion was all what was needed to return the stomach back to its normal position. In cases of organoaxial gastric volvulus reduction in this manner was not possible particularly if the hernia was incarcerated. We detached the greater omentum from the stomach a bit by bit starting distally and moving up towards the fundus. At the end we found the stomach delivered to its normal position and the greater omentum stucking in the supradiaphragmatic region. It was delivered a piece by piece using finger and round forceps.

In two cases a left thoracotomy was carried out as extensive oedema made manipulation difficult in one case and gastric necrosis was present in the second case.

At thoracotomy the oesophagus was extensively mobilized from its mediastinal bed up to the level of the

aortic arch. This required division of the middle oesophageal artery.

The lower abdominal oesophagus (4cm) was kept in the abdomen in all cases.

Once dissection was completed in both surgical approaches, the two pillars of the crus were approximated posterior to the oesophagus and anti-reflux procedure was performed. In each case sufficient length of the oesophagus was available to accomplish the repair without the need of any lengthening procedure.

Follow up examination was done by return visit patient interview and upper gastro-intestinal barium study every year for five years.

Results were considered "excellent" if the patient in the last follow up visit was asymptomatic and the stomach was located in its normal position below the diaphragm as determined by barium study.

Results were defined as "good" if there were inconsequential symptoms of reflux, dysphagia or functional derangement, non of which required therapy or additional investigations. Results were defined as "fair" if the patient had improvement in condition but had symptoms of reflux, dysphagia or functional side effects which required treatment such as medication or dilatation. Results were categorized as "poor" in patients whose conditions did not improve or worsen.

# Table (1) Signs and symptoms of 37 patients with intrathoracic stomach.

	No. of patients	Percent
Postprandial pain	18	50%
Vomiting	18	50%
Dysphagia	11	30%
Anaemia	13	35%
Reflux	29	80%
Respiratory problems	8	20%
Melena	1	3%
Haematemesis	11	30%

 Table (2): Types of operations in the 37 patients with intrathoracic stomach.

Transthoracic	2
Belsy Mark IV	1
Esophagogastrectomy	1
Trans-abdominal	35
Nissen fundoplication	15
Rosetti modification of Nissen	20

### RESULTS

Thirty seven patients presented with massive mixed hiatus hernia (intrathoracic stomach). Seven of them presented with acute incarceration. Their age ranged between 51 and 72 years, with a female to male ratio of 2 to 1. The most frequent clinical presentations are summarized in (Table 1). The most common clinical features were symptomatic reflux in 80% of cases. Postprandial fullness, discomfort, pain and vomiting in 50%. Vomiting and haematemesis were present in all patients with acute incarceration (7 patients).

X-ray chest was obtained pre-operatively in all patients and demonstrated an air fluid level behind the heart suggestive of para-oesophageal hiatal hernia (Fig. 1).

Upper gastrointestinal contrast x-ray study was performed in all cases (Fig. 2) and showed combined hiatus hernia in all of them and about 75% of the stomach was intrathoracic. Organoaxial volvulus was evident in 21 cases (Fig. 3 and 4). All patients with acute incarceration showed organoaxial volvulus.

Upper gastro-intestinal endoscopy was done in 35 cases and demonstrated the hernias in all.

Indications of surgical repair were the presence of symptoms in all cases. Seven patients were operated upon as an emergency; they were known to have intrathoracic stomach for a period of time ranging between 2-5 years. All of them had symptoms of acute obstruction "vomiting, haematemesis, hicup and dysphagia". Two of them showed signs of strangulation, oesophagogastrectomy was carried out in one case as gastric necrosis was found.

Two post-operative deaths were recorded in this work. One patient died 38 days after the operation from an oesophageal leak which resulted in mediastinitis, subphrenic abscess, septic shock and renal failure. A second elderly woman died on the sixth post-operative day after severe aspiration pneumonitis and respiratory failure.

Follow up was completed in 33 patients. No information regarding the remaining 2 patients as they never returned for a follow up visit after discharge. Three patients died of un-related disease between 6 and 23 months after the operation. At the time of last follow up visit 21 patients had "good" or "excellent" results. Twelve patients had shown fair results. One patient had undergone emergency re-operation (the patient with post-operative oesophageal leak).





*Fig.* (1) : *Plain x-ray showing air fluid level in the chest.* 



*Fig.* (3) : Contrast *x*-ray showing an intrathoracic stomach with organo axial volvulus.

*Fig.* (2): Contrast x-ray showing an intrathoracic stomach without organo axial volvulus.



*Fig.* (4): Contrast x-ray showing an intrathoracic stomach without organo axial volvulus.

#### DISCUSSION

The management of intrathoracic stomach continues to be an area of controversy, not only in the surgical literature but in the medical literature as well. The confusion lies in the classification of these defects.

In 1993, Williamson and colleagues<sup>(4)</sup> reported their observations on 119 patients with intrathoracic stomach. Although 91 of these 119 patients had a pure paraoesophageal hernia, there is no confirmatory evidence from their endoscopic report as they performed endoscopy only on 50% of patients and barium study in 96% of patients. Walther and associates<sup>(5)</sup> studied 18 patients with intrathoracic stomach and stated that all of them were pure para-oesophageal hernias. The only support in their report to the location of the gastro-oesophageal junction is the radiological criteria. They cite a reference in 1979 textbook of radiology edited by Sutton<sup>(6)</sup>.

In a recent work published by Allen and co-workers<sup>(2)</sup>, they determined the type of intrathoracic hernia intraoperatively. They judged 51 of 124 cases (40%) to be true para-oesophageal hernias. However, in this study it was difficult in our opinion to judge precisely the location of the oesophagogastric junction during mobilisation of the oesophagus at the time of surgical repair.

Contrary to many other reports<sup>(7)</sup> all cases in this study had a mixed hernia i.e large sliding hernia with a rolling para-oesophageal component and organoaxial volvulus in 57% of cases. The confirmation of the sliding element was very easy endoscopically where the endoscopic localization of the oesophagogastric junction above the diaphragmatic hiatus is easy for experienced endoscopiest. The diaphragmatic hiatus could be identified by the movement of the crural muscles in the awake patient. Maziak and associates<sup>(8)</sup>, also support our observations that massive intrathoracic stomachs are mixed sliding and para-oesphageal hiatus hernias.

Oesophageal lengthening procedure was not needed in this work, this goes with the results of Fuller and colleagues<sup>(9)</sup>. They achieved "good" or "excellent" results of repairing 115 patients with intrathoracic stomach without any esophageal lengthening procedure.

In our study most of the cases were operated upon through an upper abdominal incision without any difficulty in delivering the stomach and lower oesophagus back to their anatomical position except in two cases; one of them presented with acute incarceration, and gastric necrosis was present, transthoracic oesophago-gastrectomy was carried out. In the second case massive mural edema made it difficult to manipulate the stomach and we were obliged to do thoracotomy. Other studies <sup>(8)</sup> advise the transthoracic approach for all cases. These studies were carried out by cardiothoracic surgeons while in our opinion, an upper midline incision gave an adequate exposure for the reduction and repair of the hernia and avoids the morbidity of thoracotomy. But sometimes thoracotomy may be needed as in the 2 cases in this study.

#### CONCLUSION

In conclusion, most massive intrathoracic hernias represent advanced degrees of sliding hiatus hernia with intrathoracic displacement of the oesophagogastric junction mixed with rolling para-oesophageal component. The diagnosis is very easy and could be determined from patients symptoms, endoscopic and radiological studies.

Abdominal repair could be done in most of the cases safely and effectively even if gastric volvulus is present. If strangulation or massive tissue oedema is present in incarcerated cases, thoracotomy would be safer. Oesophageal lengthening procedure is not needed as a standard line of treatment.

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