International Surgery Journal
Sellars JN et al. Int Surg J. 2024 Mar;11(3):413-416
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: https://dx.doi.org/10.18203/2349-2902.isj20240305

Case Report

Resolution of halitosis following repair of a primary parahiatal diaphragmatic hernia

James N. Sellars*, Ryan Green, Eshwarshanker Jeyarajan

Department of General Surgery, Cairns Hospital, Cairns, Queensland, Australia

Received: 07 January 2024
Accepted: 02 February 2024

***Correspondence:**
Dr. James N. Sellars,
E-mail: jamessellars1212@gmail.com

ABSTRACT

Parahiatal diaphragmatic hernias are uncommon and often diagnosed incidentally on imaging, or in the emergency setting. Symptoms related to these defects can be like those of hiatus hernias (HH), however this is not always the case. We present a unique case of parahiatal diaphragmatic hernia that was characterised by severe halitosis which resolved with surgical repair.

Keywords: Parahiatial hernia, Halitosis, Diaphragmatic hernia

INTRODUCTION

Hernias of the diaphragm exist in many forms, the most common of which is the HH accounting for approximately 95% of cases.[1] Other recognised types in include the rare congenital hernias of Morgagni (anterior subcostal) and Bochdalek (posterolateral).[2,3] Parahiatal hernias (PHH) are even rarer and sparsely discussed in the literature, thus the true incidence is unknown. They can be primary or secondary to trauma or iatrogenic injury to the diaphragm during surgery to the thorax or abdomen. Given the anatomical distinctness of these defects from the gastro-oesophageal hiatus, a patient with PHH may not present with typical features of a standard HH such as dyspepsia or symptoms of gastro-oesophageal reflux disease (GORD) and more often complain of epigastric pain, nausea and vomiting.[1]

CASE REPORT

We present a case report of a 44-year-old Laotian male who was referred to the general surgical outpatient department with a PHH that was found on a CT scan performed for investigation of dyspepsia and left upper quadrant abdominal pain the year prior (Figure 1). This pain had become increasingly frequent over the past year, appeared to be exacerbated by hunger and he and his family had noted malodourous breath, or halitosis, that had worsened over this time. He did not experience any dysphagia, odynophagia, nausea or vomiting.

His medical background was significant for chronic hepatitis B, GORD with symptoms controlled on pantoprazole and a negative *Helicobacter pylori* faecal antigen test. He had no history of thoracoabdominal trauma and aside from a previous laparoscopic appendicectomy, had no prior surgical history.

On examination of the patient his halitosis was notable, however at this stage was not attributed to his hernia. He underwent an upper gastrointestinal endoscopy as part of his pre-operative workup. This revealed a type 2 HH as well as a PHH to the left of the hiatus found on the J manoeuvre. It was noted that the section of fundus contained within the PHH was harbouring fermenting food products (Figure 2).

An elective laparoscopic HH repair with PHH repair and anterior Dor fundoplication was performed. It was noted intra-operatively that repair of both defects could not be

performed without placing tension on the other due to their close proximity, thus the decision was made to strengthen the parahiatal repair with Phasix^{TM}ST Mesh (Figures 3 and 4).

The patient was seen in the surgical clinic six weeks post operatively and had recovered well and reported resolution of his pre-operative symptoms, including halitosis.

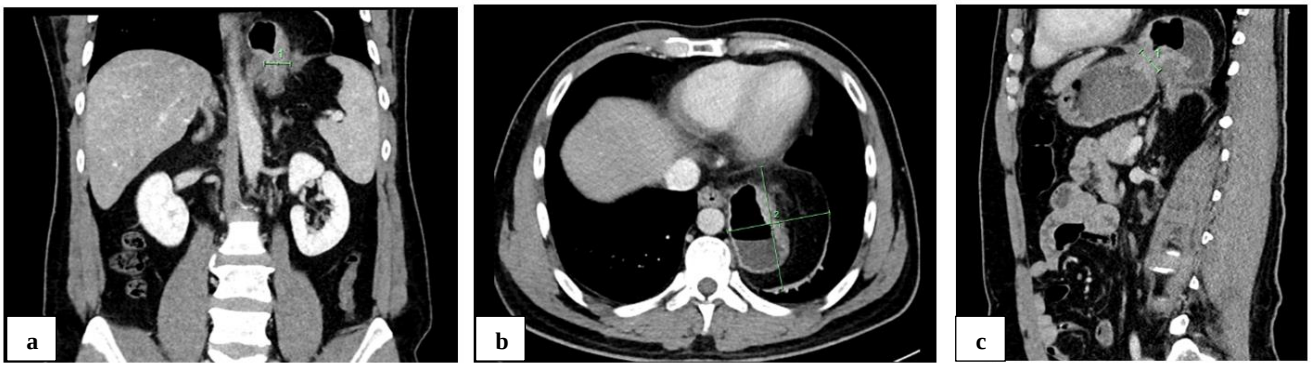

Figure 1 (a-c): CT images demonstrating the PHH in the left hemidiaphragm (left: coronal; right: axial).

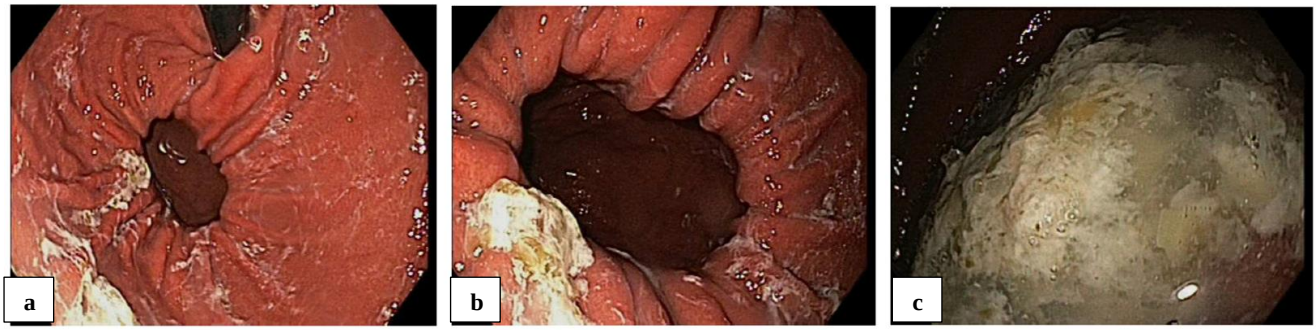

Figure 2 (a-c): Endoscopic images of the PHH during the J manoeuvre demonstrating the defect is separate to the hiatus and contains digesting food products.

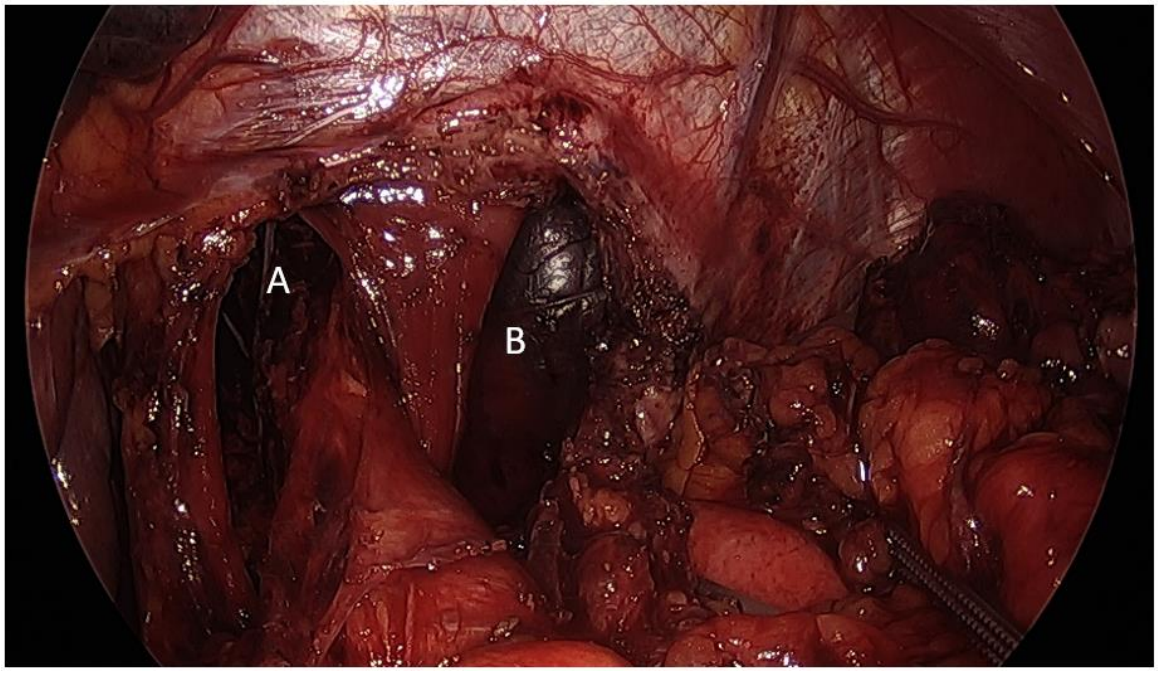

Figure 3 (A and B): A laparoscopic view of the hiatal defect and parahiatal defect post-reduction of both hernias.

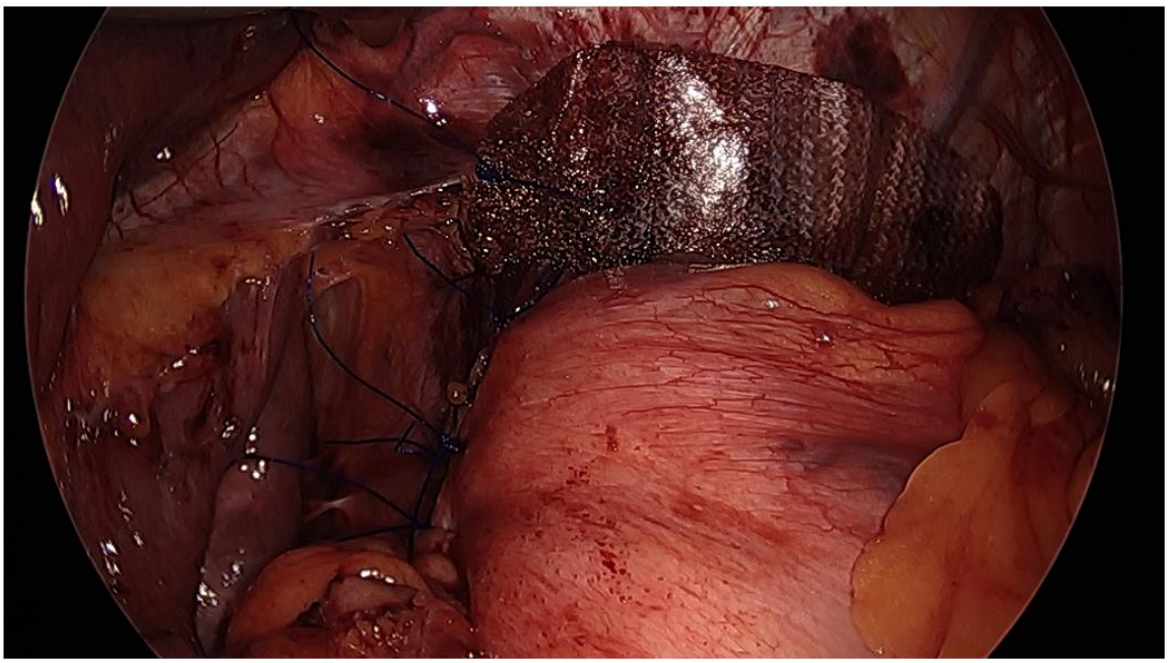

Figure 4: A laparoscopic view at completion of the operation, demonstrating the Dor fundoplication and the Phasix™ST Mesh above to strengthen the PHH repair.

DISCUSSION

The largest case series to date on PHH was published in 2020 and reported only 27 cases in the literature at the time, all of which were misdiagnosed pre-operatively, 24/27 were pre-operatively diagnosed with paraoesophageal hernias while the remainder were diagnosed as Bochdalek hernia and eventration. In this series, 19/27 cases were primary PHH and all were found in the left hemidiaphragm. Out of these, 5/19 (26%) presented with gastric volvulus, 1/19 (5%) required gastrectomy for necrosis and perforation, suggesting that PHH carry a high risk of major complications.[1]

Case reports of PHH discuss those complications of these defects typically present late or in an emergency setting due to their dormant nature.[4] Scheidler et al published a single centre case series with a PHH incidence of 0.2% (2/917). These 2 PHH were found incidentally during laparoscopic repair of presumed HH for symptoms consistent with paraoesophageal hernia. One of the patients had concomitant paraoesophageal HH, while the other had only a parahiatal defect, neither patient had complained of halitosis.[2]

Halitosis, or bad breath, is a common complaint made at visits to the dentist but infrequent in a surgical clinic. It is a multifactorial issue, with many papers dividing causes into extra-oral sources, intra-oral sources, periondontal disease and tongue coating.[5] There is controversy as to whether halitosis can exist secondary to pathology below the gastrooesophageal junction, however there are limited case reports of gastric pathology presenting with halitosis.[6] Tydd and Dyer published 2 cases of pyloric stenosis presenting with halitosis in the British medical journal in 1974, in a 47 year old female with a Crohns stricture and in a 67 year old man with gastric adenocarcinoma.[7]

CONCLUSION

Although it is uncommon PHH carries a risk of complications ranging from halitosis, as described in this case, to gastric volvulus. Historically it has been difficult to diagnose so clinicians should have a high index of suspicion if symptoms are atypical and the patient's history is not in keeping with more common diagnoses, such as HH. Additionally, in the age of liberal use of cross-sectional imaging, it may be prudent to consider surgical referral for patients in whom PHH is diagnosed incidentally.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

REFERENCES

1. Li J, Guo C, Shao X, Cheng T, Wang Y. Another type of diaphragmatic hernia to remember: parahiatal hernia. ANZ J Surg. 2020;90(11):2180-6.
2. Scheidler MG, Keenan RJ, Maley RH, Wiechmann RJ, Fowler D, Landreneau RJ. "True" Parahiatal Hernia: A Rare Entity Radiologic Presentation and Clinical Management. StatPearls. 2002.
3. Brown SR, Horton JD, Trivette E, Hofmann LJ, Johnson JM. Bochdalek hernia in the adult: Demographics, presentation, and surgical management. Hernia. 2011;15(1):23-30.

4. Zafar N, Martinez Isla A. Parahiatal Hernia. StatPearls Publishing LLC. 2023.
5. Wu J, Cannon RD, Ji P, Farella M, Mei L. Halitosis: prevalence, risk factors, sources, measurement and treatment-a review of the literature. Aust Dent J. 2020;65(1):4-11.
6. Bansal M, Gupta N, Chand Rao N. Oral Malodour: A Systemic Review. Indian Assoc Publ Heal Dentistr. 2011;9(18):65-71.
7. Tydd TF, Dyer NH. Medical memoranda Pyloric Stenosis Presenting with Halitosis. 1974;3(5926):321.

Cite this article as: Sellars JN, Green R, Jeyarajan E. Resolution of halitosis following repair of a primary parahiatal diaphragmatic hernia. Int Surg J 2024;11:413-6.