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RESEARCH ARTICLE

DIAPHRAGMATIC HERNIAS REPAIR THE THORACIC APROACH - BELSEY MARK4. OUR EXPERIENCE

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ABSTRACT

Background: Left thoracotomy and Belsey Mark 4 operation for diaphragmatic hernia repair considered another option for treatment. Aim of the study to present, strategy for treatment, operative technique and literature review. **Methods**: During a 20 year period a retrospective study took place. Seventeen (17) patients underwent left thoracotomy and Belsey Mark 4 operation for diaphragmatic hernia repair at Department of Thoracic Surgery, Oncological Hospital of Kifisia-Agioi Anargyroi, Athens Greece. **Results:** During the years 2001 to 2021, seventeen (17) patients 12 male 5 female underwent left thoracotomy and Belsey Mark 4 operation for diaphragmatic hernia repair, aged 33 to 76 years mean 55 years and hospital stay 4 to 7 days. All patients underwent preoperative gastro esophageal studies included ph studies, manometry and oesophagogastroscopy. The majority (70%) developed oesophagitis grade 3 -4. Also two of seventeen patients no significant oesophagitis diagnosed but reflux episodes reported. All these seventeen patients underwent left lateral thoracotomy, immobilization of oesophagus to aortic arch, hiatus mobilization fundoplication of oesophagus 270^0 and Belsey Mark 4 procedure. No death or any other complication recorded. The hospital stay was 4 to 7 days. All patients underwent postoperative gastro esophageal studies included ph studies, manometry and oesophagogastroscopy. The majority of the patients had significant improvement. The follow up was from 1to 20 years mean 7 years. Only one male patient to seventeen did not attend. **Conclusion:** Left thoracotomy and Belsey Mark 4 operation for diaphragmatic hernia repair considered another option for treatment with lower complication rate. No thoracic pain has been recorded. Needs to be done by experience and well trained team.

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INTRODUCTION

Today the laparoscopic repair of a hiatal hernia has almost completely replaced the open approach (laparotomy or a left thoracotomy). Left thoracotomy and Belsey Mark 4 operation for diaphragmatic hernia repair considered another option for treatment with low complication rate.

METHODS

During a 20 year period a retrospective study took place. Seventeen (17) patients underwent left thoracotomy and Belsey Mark 4 operation for diaphragmatic hernia repair at Department of Thoracic Surgery, Oncological Hospital of Kifisia-Agioi Anargyroi, Athens Greece.

RESULTS

During the years 2001 to 2021, seventeen (17) patients 12 male 5 female underwent left thoracotomy and Belsey Mark 4 operation for diaphragmatic hernia repair, aged 33 to 76 years mean 55 years and hospital stay 4 to 7 days. All patients underwent preoperative gastro esophageal studies included ph studies, manometry and oesophagogastroscopy. The majority (70%) developed oesophagitis grade 3 -4. Also two of seventeen patients no significant oesophagitis diagnosed but reflux episodes reported. All these seventeen patients underwent left lateral thoracotomy, immobilization of oesophagus to aortic arch, hiatus mobilization fundoplication of oesophagus 270^0 and Belsey Mark 4 procedure.

• Congenital diaphragmatic hernia
-Morgagni's hernia: less common type, occurring in only 5–10% of cases with 90% of cases involving the right side (anterior midline—foramen of Morgagni)
-Bochdalek's hernia: congenital diaphragmatic hernias (posterolaterally)
• Iatrogenic diaphragmatic hernia
Caused by surgical procedures on the chest or in the abdomen
• Traumatic diaphragmatic hernia
Traumatic aetiology as the result of a traffic accident, falls, stab wounds, gunshot wounds, blunt injuries
• Hiatal hernia
Occurs when the upper part of the stomach moves through the diaphragm to the chest. Diaphragm has a small opening (hiatus) through which oesophagus passes before connecting to the stomach

Table 2. Symptoms and Signs

Heartburn
Regurgitation
Backflow of stomach acid into the esophagus (acid reflux)
Difficulty swallowing
Chest pain
Abdominal pain
Feeling full soon after meals
Dyspnoea
Tachypnoea,
Cyanosis
Tachycardia,
Haematemesis,or and melena
Diminished or absent bowel sounds in the chest area

No death or any other complication recorded. The hospital stay was 4 to 7 days. All patients underwent postoperative gastro esophageal studies included ph studies, manometry and oesophagogastroscopy. The majority of the patients had significant improvement. The follow up was from 1to 20 years mean 7 years. Only one male patient to seventeen did not attend.

DISCUSSION

Diaphragm is a muscular barrier between chest and abdomen. It separates heart and lungs from abdominal organs (stomach, intestines, spleen, and liver). A diaphragmatic hernia occurs when one or more of abdominal organs move upward into the chest through a defect in the diaphragm.[1,2] The hernia can be present at birth (congenital diaphragmatic hernia) or acquired later in life as acquired diaphragmatic hernia.[1,2] as a result of a blunt injuries due to a traffic accident, surgical procedures on the chest or abdomen, falls, stab wounds, gunshot wounds.[1,2,3,4] May be undiagnosed for a long period of time, until it becomes symptomatic.[1,2] Pregnancy also reported for hiatal hernia. Risk factors obesity, pregnancy and age above fifty.[1,2] In small hiatal hernias patients may be asymptomatic, but in large one may be presented with: see Table 2. Clinical examination, anamnesis are basic and need to be done. Chest radiography (CXR) may demonstrate an abnormal shadow – opacity Barium or Gastrografin meal may show stomach in pleural cavity. Endoscopy, oesophageal manometry and Computer tomography considered gold standard for diagnosis. The medical treatment based on Antacids, Proton pump inhibitors or H-2 receptor blockers and Prokinetics.[1] When medical therapy is not effective because of reflux esophagitis with ulcerations, stricture, or bleeding, recurrent aspiration pneumonia, large sliding hernias, then considered surgical treatment.

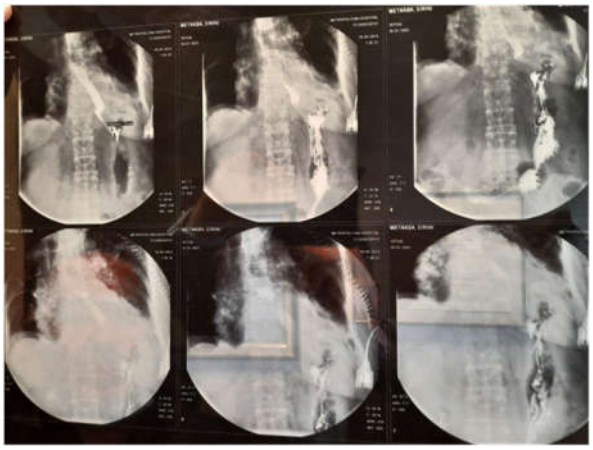

Image 1. Post procedure

The surgical treatment considered effective and can be done by accomplished by laparotomy, laparoscopy, thoracotomy or thoracoscopy. [1,2]The aim of the operation repositioning the stomach below the diaphragm and to re-establish gastro esophageal competence. The advantage of a thoracic approach is that reduction of the hernial contents can be easily achieved aided by the pneumothorax, with a hypoplastic lung providing better vision. [1,2]

Operative technique: All patients had a double-lumen endotracheal tube. Before induction of anesthesia an epidural catheter was placed to facilitate postoperative pain control. The surgical approach was via a left lateral thoracotomy through the 6th or 7th intercostal.[5] Dissection and incision of the mediastinal pleura were performed as needed up to the level of the aortic arch. The hernial sac was dissected off the diaphragm. The esophagus was elevated using a Penrose drain. Traction was placed on the esophagus and the phrenoesophageal membrane was incised circumferentially. The fundus of the stomach was mobilized, while the vagus nerves were preserved.[5] The diaphragmatic crura (or more commonly the right and left bundles of the right crus) were then approximated posteriorly by 3-4 interrupted 0 silk sutures, which were left untied. An evaluation of the adequacy of the esophageal mobilization was then made and, if necessary, further mobilization was performed. The fundus was pulled up, 3 horizontal mattress sutures were placed 1.5-2 cm from the esophagogastric junction between stomach and esophagus to create the 270° wrap and these were then tied.[5]

Afterwards, the second row of sutures was placed 1-1.5 cm proximally so as to include the diaphragm and, after reduction of the fundus into the abdomen, these were tied also. Finally, the sutures between the crura were tied up to the point where a finger could pass easily through the hiatus.[5] A pleural drainage tube was then placed and the thoracotomy closed. Analgesia was maintained with epidural bupivacaine, non-steroidal anti-inflammatory drugs and systemic opiates, as needed. The patients were examined with an upper gastrointestinal series on the 4th postoperative day and they discharged from the hospital on the 5th or 6th postoperative day. Schaarschmidt et al,[6] reported a technique in which a thoracoscopic inflation-assisted reduction of the thoracic contents was performed. This technique offers a more physiologic access to congenital diaphragmatic hernia than laparoscopy or laparotomy. However, the drawback of such techniques is the inability. It is also more difficult to identify bowel injury and the vision in peritoneal cavity is limited.[6] Today the laparoscopic repair of

a hiatal hernia has almost completely replaced the open approach through either a laparotomy or a left thoracotomy. Acute gastric volvulus occurs when the stomach or a part of it rotates more than 180 degrees which leads to obstruction (closed loop syndrome), that finally concludes to incarceration and ischemia of the organ. It can be observed as a result of diaphragmatic hernia, a gap of the diaphragm, pancreatic or gastric cancers, traumatic injuries and fixation anomalies.[7] Palanivelu et al reported post operative three patients developed volvulus and they resolve the complication.[2] To mention that volvulus did not happen postoperatively to our patients. Geha et al they supported that hernias should be repaired soon after recognition.[8] Reflux should be evaluated before the operation, and if present, fundoplication should be part of the repair along with the reduction of the hernia, excision of the sac, gastropexy, and crural closure. They operated 100 patients during the years 1967 -1999.[8] Eighty patients underwent an elective operation, and 20 patients underwent an emergency procedure for complications. A thoracic approach was used in 18 patients, postoperative gastric volvulus requiring transabdominal repair developed in 2 patients. The remaining 82 patients underwent an abdominal repair, with temporary gastrostomy to prevent gastric displacement in 75 patients; the hernial sac was resected, and the hiatus was reconstructed in all of the patients. Thirty-five patients with reflux on preoperative work up underwent a fundoplication, with gastroplasty in 2 patients because of a short esophagus. No patient has experienced hernia recurrence. Reported 2 hospital deaths among those patients who underwent emergency operation. Cubas et al, supported that Robotic-assisted paraesophageal hernia repair is a safe procedure that has a learning curve of about 36 cases.[9] Upon review of the literature, this approach seems to have the same benefits as those of the laparoscopic approach in terms of total surgical time, complication rate, length of hospital stay, and quality of life.[9]

CONCLUSION

Left thoracotomy and Belsey Mark 4 operation for diaphragmatic hernia repair considered another option for treatment with lower morbidity and complication rate. Minimal thoracic pain has been recorded and was treated with analgesic oral medication while home. Needs to be done by experience and well trained team.

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REFERENCES

1. Efstathios K. Metaxas, Theodoros Piperos et al. Hiatal Hernias Therapy. Our experience. International Journal of Current Research Vol. 13, Issue, 04, pp.16865-16868, April, 2021
2. Chinnusamy Palanivelu, Muthukumaran Rangarajan et al. Laparoscopic repair of adult diaphragmatic hernias and eventration with primary sutured closure and prosthetic reinforcement: a retrospective study. Surgical Endoscopy volume 23, pages 978-985 (2009).
3. Metaxas, E.K., Moustardas, M.P., Gerazounis. M.I.Rib Fractures: Retrospective Analysis of1428 Cases.
4. Surgical Chronicles Vol 19, Issue 1, Jan-Mar 2014.
5. Efstathios. K. Metaxas, Nicolas Condilis et al. Sternal fracture with or without associated injuries. Assessment of the difference in the diagnosis and complications. Eighteen years of experience. Annali Italiani Di Chirurgia 2006 ;77:379-383.
6. Charalambos Markakis, Periklis Tomos, Eleftherios D. Spartalis, Pavlos Lampropoulos, Leonidas Grigorakos, Dimitrios Dimitroulis, Elias Lachanas, Andreas Agathos. The Belsey Mark IV: an operation with an enduring role in the management of complicated hiatal hernia. BMC Surgery 2013 13:24 DOI: 10.1186/1471-2482-13-24
7. Schaarschmidt K, Strauß J, Kolberg-Schwerdt A et al. Thoracoscopic repair of congenital diaphragmatic hernia by inflation-assisted bowel reduction in a resuscitated neonate: a better access? Pediatr Surg Int 21:806–808 (2005)
8. E.K.Metaxas, N.Condilis, H.Kyriazis et al. The management of acute gastric volvulus. Annali Italiani Di Chirurgia 2007Nov–Dec ;78(6):501-3.
9. Alexander S Geha, Malek G Massad, Norman J. Snow et al. A 32 year experience in 100 patients with giant paraesophageal hernia: The case for abdominal approach and selective antireflux repair.Central Surgical Association Volume 128, Issue 4, P 623-630, Oct 2000.
10. Robert F. Cubas, Joslin N. Cheverie, Santiago Horgan. Robotic Paraesophageal Hernia Repair Management of Gastroesophageal Reflux Disease pp119-137 July (2020)