CHAPTER 47

TREATMENT OF PECTUS EXCAVATUM

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INTRODUCTION

Pectus Excavatum (PE), also known as the funnel chest , is the most common chest wall deformity (1). It is characterized by the depression of the anterior chest wall and sternum. They occur in 1 of every 300 to 400 births and the deformity is seen 5 times more often in males compare to women (2). In a recent publication; Biavati and friends reported that population-based prevalence of pectus excavatum in adults of 0.4%. Leonardo da Vinci portrayed the first image of PE in 1510 which makes it the first ever presentation of the deformity (3). Eggel published the first report in the literature in 1870 and identified the deformity as a depression of the anterior chest wall (4). Kwiecinski reported the evaluation of computed tomography (CT) scans of 217 mummies in which 3 PE cases were detected. This information reveals the presence of the deformity in antique times with similar prevelance up to date.

Even though the etiology of the deformity is not clearly identified yet, there are some theories and hypothesis remarking the pathophysiology of PE. These theories indicate the posterior traction of the sternum and intrinsic failure of osteochondrogenesis secondary to intrauterine pressure, rickets, pulmonary restriction or diaphragmatic deformities. In addition to these theories, some biochemical irregularities, which include malformation in the type 2 collagen production in costal cartilages and abnormal levels of zinc, magnesium and calcium, were detected (5).

The genetic perspective of PE still remains unknown, but clinical evidence supports that PE is a genetic disorder as 40% of the patients have affected family members with similar congenital deformities (5). Although we couldn't identify any specific loci in any genes directly related to disorder, there are new studies showing some potential genomes (6,7,8).

Clinically, PE patients have a stereotypical posture: thin, tall patients with a pot-belly and forward-drifted shoulders. Although it is still controversial and there is no consensus among physicians as to whether or not pectus excavatum can produce symptoms enough to justify a surgical procedure, posterior traction of the sternum can displace the heart and may have a negative effect on lung volume and cardiac functions. As a consequence of this anatomical disposition some patients may experience chest pain, dyspnea on exertion, palpitations, fatigue and low exercise tolerance (9,10,11). Dr.Gaston and friends published the data about cardiac morphology and function according to the site of maximum compression and reported that patients with a compression to the right ventricle and AV groove experience diverse cardiac abnormalities (12). In

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the surgery can sometimes turn into a long lasting issue and ends up with early unplanned removal of the bar. Satisfaction rates after correction with MIRPE are reported between 80 – 97%. Patients who underwent MIRPE could be able to return their daily life in very short periods of time, in relation to the nature of minimally invasive surgeries and as MIRPE being one of them.

1084 patients had been operated with MIRPE between August 2005 – December 2020 (Resim 1,2,). 937 (86.4%) patients were male, 147 (13.6%) were female and the median age was 18.62 years (range: 4-58). The deformity was symmetric in 824 (76%) and asymmetric in 260 (24%) cases. One pectus bar was used in 661 (61%) cases, two in 401 (37%), three in 22 (2%) cases for the correction of the deformity. The median operation duration was 72 minutes (range: 20-180) and the median duration of hospital stay was 4 ± 1.5 days (range: 2-10). Scoliosis was the most common coexisting anomaly with 252 (23.2%).

176 (16.2%) patients had a positive familial history for chest wall deformities. Postoperative management was maintained by epidural analgesia in 85 (7.8%) patients and PCA in 999 (92.2%) patients. Quality-of-life (QOL) questionnaires revealed 95% satisfaction in terms of correction.

In concordance with the existing literature; as seen in 38 (3.5%) patients pneumothorax emerges as the most common perioperative complication. While 8 of them needed chest tube insertion, the rest of them were treated conservatively. Pleural effusion was detected in 9 (0.83%) patients whom only 3 drained with tube thoracostomy . Thoracotomy was performed in 2 (0.18%) patients owing to myocardial laceration.

Wound infections and insufficient correction were the leading cause of late postoperative complications with 56 (5.1%) and 20 (1.8%), respectively. 9 of the patients with insufficient correction were managed with second surgery for the correction. Cellulitis (8 patietns 0.73%), bar displacement (8 patients 0.73%) , seroma (3 patients -0.35%) and pneumothorax (5 patients 0.46%) were the other late postoperative complications.

Bar removal was performed in 764 patients, 622 of whom were on scheduled time frame. Most alarming complication during bar removal surgeries was life threatening hemorrhage which managed by packing conservatively in 3 of them. While one of the other two needed left thoracostomy, extension of the primary incision was enough in the other one.

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