

TREATMENT OF PECTUS CARINATUM



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INTRODUCTION

The two most common deformities of the chest wall are pectus excavatum and pectus carinatum. (1) Pectus Carinatum (PC) is the second most common chest wall deformity following Pectus Excavatum (PE) (2). It is also frequently referred to as pigeon chest, chicken breast, and pyramidal chest. Pectus carinatum is basically described as the anterior protrusion of the sternum and adjacent cartilage (3). The deformity is seen as 1 in 1000 live births and the prevalence of pectus carinatum is reported approximately 0.6% (4). Similarly to PE, it is more common in boys than in girls, with a ratio of 5:1. New innovative techniques had been developed for the treatment of pectus carinatum by appreciating the malleability of the chest wall. These include both nonoperative therapy with compressive orthotic bracing and surgical repair applied by the help of metal bar (5,6,7). Even though the exact etiology of PC is not clear, it is important to draw attention to genetic predisposition in consideration with 25-40% of the patients having another family member with the deformity. It is common to see PC as an isolated deformity but on the other hand it can be detected together with genetic based diseases like Marfan Syndrome, Morque Syndrome and Ehler-Danlos Syndrome. In addition to existing literature, Dr.Hunt and colleagues presented

that 51.6% of 258 PC patients have one or more associated musculoskeletal abnormalities which are recorded as forward head posture, rounded shoulders, uneven shoulders, thoracic khyphosis, lumbar lordosis, anterior pelvic tilt and scoliosis. Similar to this data; one of our studies also showed that 51.4% of both pectus excavatum and carinatum patients have 4 or more of these associated musculoskeletal disorders.

PC is classified into two subgroups as “chondroglandiolar and “chondromanubrial” according to anatomical distribution of the deformity. We can define chondroglandiolar deformity as asymmetric or symmetric prominence of inferior costal cartilages and sternum. Asymmetric deformity occurs as a result of unilateral overgrowth of costal cartilages and abnormal rotation of the sternum. Chondromanubrial deformity is also referred as Pectus Arcuatum (PA) and described as protrusion of manubrium sterni and superior costal cartilages. PA is less than 1% of all PC cases and the optimal correction is achieved by Ravitch Sternoplasty.

In general, patients with PC do not complain about any symptoms and most of the literature supports the neutrality of the deformity on cardiopulmonary functions. Del Frari and friends recently published their prospective study and reported that correction of PC does not have an effect on cardiopulmonary function (9). On the

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38 (19.4%) patients had family history for congenital chest wall deformities (PE or PC). The type of the PC was chondroglandiolar in all of the 195 patients. MIRPC with our technique was performed by using one bar and two stabilizers in every each of the patients. The median operation duration was 77 minutes (range:45-120 minutes). Length of stay was 2-10 days with a median of 3.7 days.

Most frequent perioperative complications were wound infection and pneumothorax with 17 (8.7%) and 12 (6.15%) patients, respectively. We treated wound infections with antibiotherapy, drainage or vac therapy. Among patients complicated with pneumothorax while one of them needed chest tube insertion and 4 of them needle aspiration. the rest of them just improved without any intervention.

We experienced wire breakage in the early postoperative period in 5 (2.5%) patients who had been operated with single layer steel wires (twice wire breakage in one patient), metal lalergy in 5 (2.5%), erosion of the skin in 3 (1.5%) patients, pleural effusion in 3 (1.5%) patients, intractable pain in 3 (1.5%) patients, brachial plexus injury in 1 patient (0.51%) and stabilizer dislocation in 1 (0.51%) patient as complications.

We performed bar removal in 2 of the 5 nickel allergy patients. Patients with dermal erosion were re-operated for the revision of the skin.

Overcorrection is the leading late postoperative complication with 11 (5.6%) patients. While the bar was removed earlier than the scheduled date in 1 of the over-corrected patients, 9 of them underwent bar removal surgery in the first year. Only 1 of them completed the optimal time frame with 2 years Hyperpigmentation (3 patients-1.5%), cutting of the ribs by sternal cable (2 patients- 1.02%), granuloma (1 patient- 0.51%) are the other late complications. We also had 4 (2.05%) insufficient correction patients who were operated for the readjustment of the bars.

Up to date; we had removed bars of 158 (81%) patients among our series after a follow-up of 2-3 years. All of them were removed without

any complications on the basis of routine procedure. Recurrence occurred only in 2 patients after removal operations at planned date and we followed up these patients with CBT. We now, remove bars within 2 years after MIRPC owing to the development of modified bars.

Among the whole series, 8 (4%) cases were not satisfied with the results. Both psychosocial and physical changes were detected after the correction with MIRPC. Patients were more positive, more compatible with self-confidence and socially more active after the operation. Overall patient satisfaction after MIRPC operation was 96%.

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