

SURGICAL CORRECTION OF PECTUS CARINATUM

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Pectus carinatum is a protrusion deformity of the chest of developmental origin, sometimes called «pigeon breast» or chondrosternal prominence. It is the second most common deformity of the anterior bony thorax, but occurs much less frequently than pectus excavatum. Ravitch saw more than 100 cases of congenital anterior chest deformity of which only three were pectus carinatum.¹ Only one fifth of Robicsek's cases were pectus carinatum.² Twelve patients with congenital anterior chest deformity have been operated on at Hacettepe Medical Center, and only two of these had pectus carinatum.³

The etiology of pectus carinatum is unknown, but it is thought that a genetic factor may be involved. Both pectus carinatum and excavatum may be seen in the same family.⁴ Robicsek reported on six families in each of which more than one member had one or the other of these deformities.²

The role of the diaphragm was first mentioned by Bauhinus in 1594 and emphasized later by Brown. According to Bauhinus and Brown, short substernal ligaments were associated with pectus excavatum, and long ones with carinatum. The deformities were also correlated with respiration.⁵⁻⁷ Lester's autopsy studies have proven that the diaphragm is largest in pectus carinatum and smallest in excavatum.⁴

Sweet has proposed another explanation of chondrosternal deformities of the chest.⁸ He suggests that the deformity of the sternum is secondary to an overgrowth of the costal cartilages. When the cartilage grows inward, the result is pectus excavatum; when it grows outward, the result is pectus carinatum. Although the explanation sounds convincing, Sweet's surgical technique, resection of the overgrown cartilage only, was unsuccessful. Satisfactory results could be obtained by resecting the substernal ligament as well as the cartilage.⁹

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Pectus carinatum is simply the inverse of pectus excavatum. In the latter, the xiphoid goes inward on inspiration; in the former, it goes outward. This is, in some cases, a very important distinction in making the differential diagnosis. For example, in 1950, Lester reported a case of pectus excavatum which he later admitted was a mistake and the patient actually had pectus carinatum.⁴

Pectus carinatum is usually a symmetrical deformity, but it may be unilateral.⁹ Robicsek also describes a third type, chondro-manubrial prominence.²

Clinical symptoms of pectus carinatum are not distinctive and many patients have no symptoms at all. Two patients whose deformities were corrected at Hacettepe Medical Center had no symptoms, clinically. However, the psychological aspects of this anomaly are very important, as they are in pectus excavatum. The children so affected are usually very shy and depressed. During their school years, they try to avoid outdoor activities and often hate swimming or other sports that would expose their deformities. Feelings of inferiority develop rapidly, generally beginning with the school years. We believe that these psychological problems are indication enough for surgery, regardless of the clinical symptoms. We also believe that surgery should be performed before school age.

Case Reports

Case 1: H. T. (58/4420), a five year old boy, was admitted to the thoracic surgery service with marked bilateral pectus carinatum. No clinical symptoms were present. The operation was performed on November 12, 1962, with a vertical midline incision. The fourth, fifth, sixth, seventh, eighth and ninth costal cartilages were resected bilaterally and subperichondrially. A transverse osteotomy of the sternum was done at the beginning of the abnormal forward curvature. The posterior periostium was left intact, and the sternum was pushed into its normal position. The pectoralis muscles were resutured to the sternum to keep it in this new position without using any fixation material. The substernal space was drained with two Penrose drains. The patient was dismissed on the twelfth post operative day with excellent results (Figures 1 and 2).

Case 2: S. K. (65/30781), a 12 year old boy, was admitted to the hospital with moderate bilateral pectus carinatum and was operated on in July 1965. The surgical technique was the same as described above, and again no fixation material was used. The patient was discharged on the twentieth post operative day in excellent condition (Figures 3 and 4).



Figure 1. Five year old patient before operation, showing degree of pectus carinatum.



Figure 2. The same patient after operation.



Figure 3a and b. Eleven year old patient before operation, front and side views.

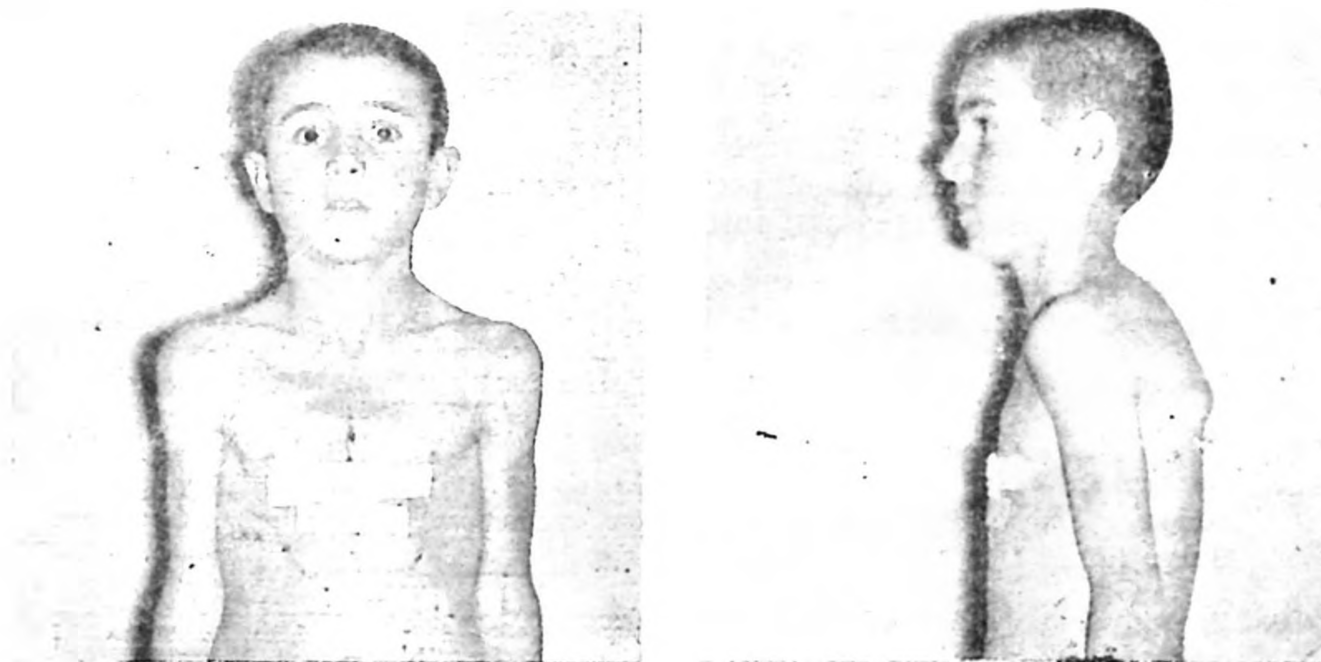


Figure 4a and b. Same patient after operation.

Discussion

Pectus carinatum is a rare anterior bony thorax deformity. Although there are usually no clinical symptoms, surgical correction of the deformity is advised in order to prevent the development of psychological problems as the child grows up and goes to school. Surgery should be performed preferably between the ages of two and six years. The results of surgery are very satisfactory.

Summary

Twelve patients with chondrosternal chest deformity were operated on at Hacettepe Medical Center between 1962 and 1965. Of these, two were cases of pectus carinatum. No artificial temporary fixation was used after surgery in these two cases. The results of surgery are very satisfactory.

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