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A CASE OF PECTUS EXCAVATUM

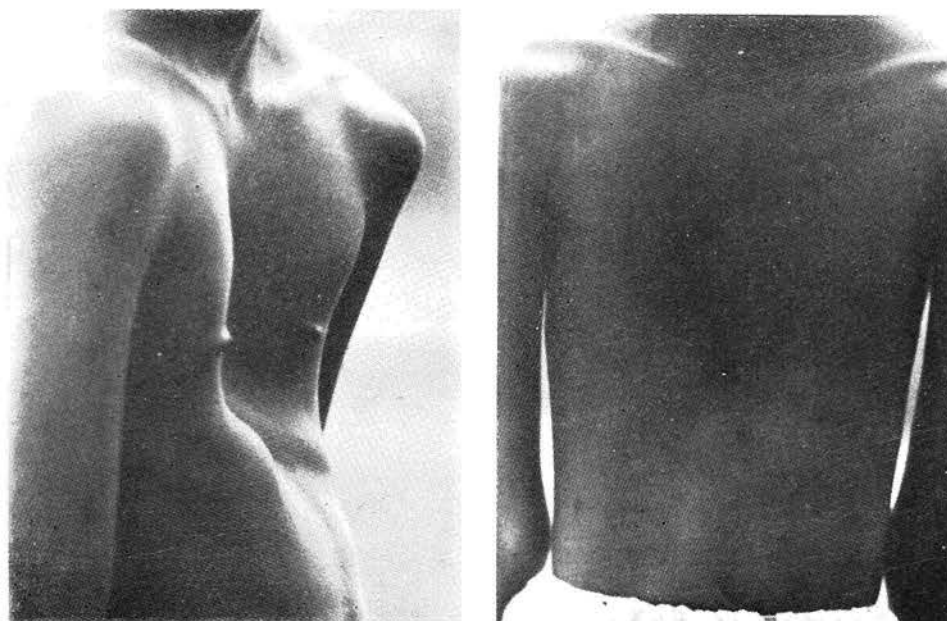
BY

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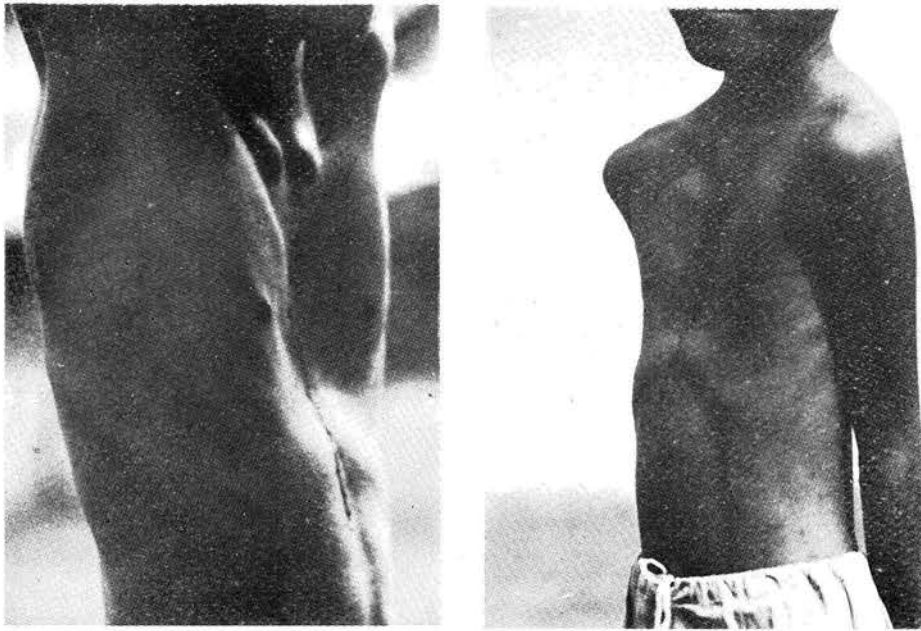
Lady Templer Hospital, Kuala Lumpur

A Malay Girl, aged 9, was admitted to the Lady Templer Hospital on August 12th 1960. She complained of a chest deformity and slight dyspnoea. Her dyspnoea was of a degree that prevented her from playing vigorous competitive games, otherwise it caused no interference with her activities.

She was a thin girl of normal height and cheerful disposition. She suffered from a severe degree of Pectus Excavatum. Her sternum inclined backwards from the junction of the manubrium and gladiolus, the manubrium being in its normal position. The xiphisternum was in contact with the spine in front of the twelfth thoracic vertebra. The costal cartilages were long and inclined sharply backwards from their junctions with the ribs to meet the sternum. Unhappily the ribs themselves curved inwards at their front ends. This produced a broad depression extending laterally to the mid-clavicular lines on each side. In this type of depression only moderate improvement can be achieved (Chin).



Pre-operative Appearance.



Post-operative Appearance.

Though the air entry sounded normal, the chest movements were poor. Her heart was entirely in her left chest.

Her parents were advised that an operation would improve the appearance of her chest and make it easier for her to breathe on exertion. They were warned that complete restoration to normality was unlikely.

The operation to correct a Pectus Excavatum is a severe one. Each element of the deformity is dealt with in turn. Abnormalities maintaining the deformity are the backward angulation of the gladiolus, the elongation and backward curvature of the costal cartilages and the strong band of tissue holding the xiphisternum to the spine.

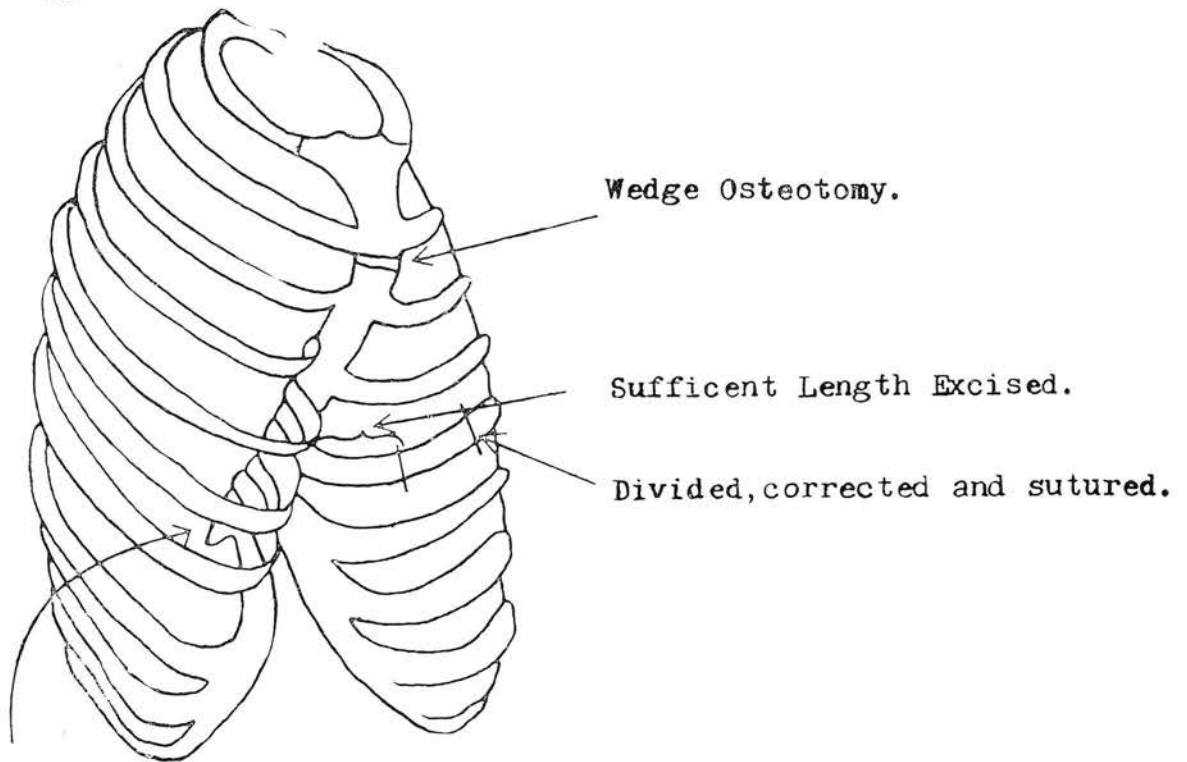
An incision was made in the mid-line from the manubrium to the centre of the epigastrium. The skin and pectoral muscles were elevated laterally to expose the sternum and costal cartilages. A wedge osteotomy was made with a Hey's saw just below the manubrium. Wire sutures were placed in the bone edges. These would be tied later when the sternum was lifted forwards. The linea alba was incised and the xiphisternum freed without opening the peritoneum. A short strong band was found behind the xiphisternum and divided. This step proved to be difficult for the sternum was almost touching the spine and the band was very dense and short. Once division had been done it was easy to pass a finger up behind the sternum and free it of mediastinal tissue and pleura. The pleura was pushed laterally as far as possible off the deep surfaces of the costal cartilages on each side.

The 3rd, 4th, 5th, 6th and 7th costal cartilages were cut away from the border of the sternum on each side. The sternum could now be lifted forward, hinging on the wedge osteotomy. Lengths of costal cartilage were excised. The length to be excised from each was judged as sufficient to allow reattachment of the remaining cartilage to the sternal border with the sternum in its corrected position. The inclination backwards of the cartilages was corrected by cutting wedges from the fronts of the cartilages with a knife at the point where the cartilage turned backwards.

The wire sutures in the sternal osteotomy were tied. The cartilages were sutured to the sternal edges and a wire loop passed through drill holes in the gladiolus at the level of the sixth costal cartilage. The wedge incisions in the cartilages were not sutured as the intact intercostal muscles held the cut ends in place and reliance was placed on the wire loop to maintain the new position of the sternum until healing was firm.

The ends of the wire loop were brought out of the skin on each side of the incision. The wound was closed in layers.

A plaster of paris shield containing a strong wire bridge was placed over the front of the chest. The ends of the wire loop were pulled strongly forwards bringing the sternum as far forwards as possible. The ends of the loop were then fixed under tension to the bridge. Care must be taken in providing fixation. Without it the sternum will float freely during respiration, possibly causing fatal anoxia.



Band divided.

Fig.1. Oblique view of the deformity.

Corrected position of Sternum.

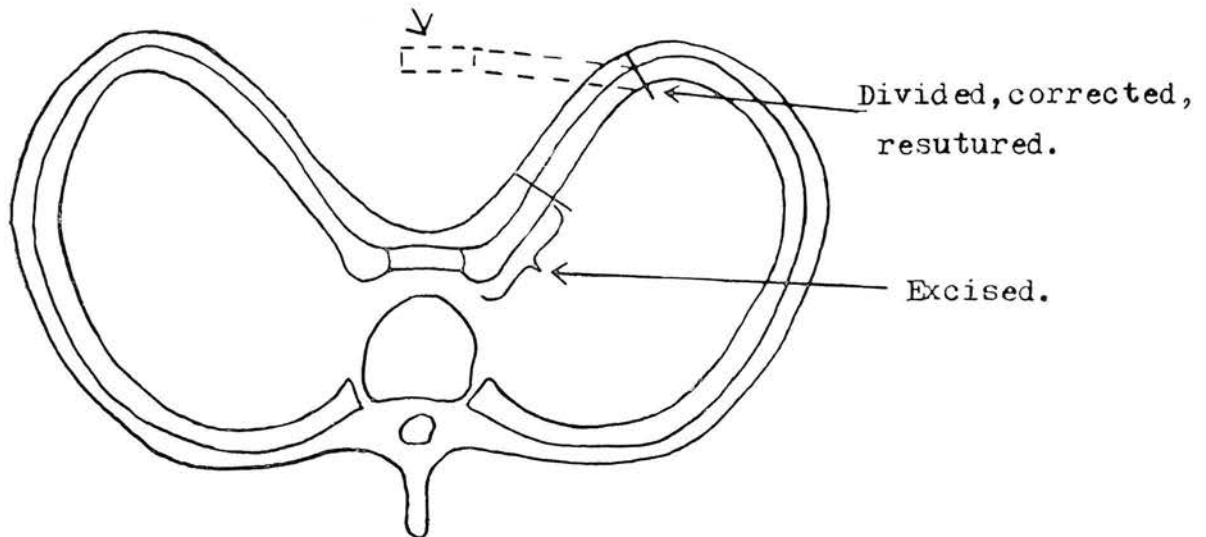


Fig.2. Transverse section of the deformity.

During the operation the right pleura was torn and sutured.

While recovering from the anaesthetic the patient became cyanosed. Air and some blood were aspirated from the right pleura and the holding wire was tightened.

The total blood loss during the operation was 300cc. Two aspirations of the right chest produce a total of 300cc. in addition to the operation loss. There were no post operative troubles other than this.

For four weeks the child ran about the hospital grounds. Breathing exercises and training designed to teach her to walk upright (so drawing the sternum forwards) were given daily. At the end of this time she was given a short general anaesthetic and the shield and holding wire were removed. She left hospital in good health.

The improvement in the deformity can be seen in the photographs. Before operation the depression was 5" deep, after operation it was 2" deep. A radiograph of the chest before operation showed the xiphisternum in contact with the spine, after operation the xiphisternum was 2½" in front of the spine. Chest movements were greatly improved. The heart did not move back into the mediastinum.

Pectus Excavatum is a congenital deformity. Its cause is unknown. The simple explanation that the band of tissue fixes the sternum at its lower end and holds it back is discounted for no particular reason. It is suggested that the primary defect is overgrowth of the costal cartilages. When this occurs the sternum is pushed backwards and held in this abnormal position. Whatever the cause may be the deformity is an ugly one. In addition it interferes with full movement of the ribs and prevents the upward and downward movement of the sternum because the lower end of this bone is fixed. When the depression is narrow or if it is asymmetrical, affecting one side, a good result can be achieved. The type encountered here which was broad and deep is much more difficult to correct. This case was considerably improved but the final result was imperfect. The greatest benefit this child received from the operation was the greatly increased efficiency of her breathing. She spontaneously commented on this and was very proud of her new powers of respiration.

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