SUPERIOR MEDIASTINAL TERATO-DERMOIDS

A Report of Two Cases

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Mediastinal terato-dermoids can be classified into three different types, namely dermoid cysts, teratomata and a complicated pathological group which does not fit into either of the first two groups.

The first example of a terato-dermoid of the mediastinum was reported by J. A. Gordon in 1823. Kerr and Warfield (1928) computed the total number of recorded cases at 138, but it is doubtful if all the reported cases were in reality genuine examples of intrathoracic terato-dermoids. Rusby (1944) critically analyzed the literature up to 1939 and estimated that 245 of the cases were terato-dermoids and reported six further cases. In 1945 Laipply independently arrived at the same total and added one case of his own. Since this date there have been several further cases reported in the literature.

Terato-dermoids are usually situated in the anterior mediastinum. These tumours may be located in one or other side of the thorax.

It appears that the first successful operation for removal of a mediastinal terato-dermoid was by Senn (1905). Since then several successful cases have been reported, the most recent report, of four cases, being by Bradford, Mahon and Grow (1947).

It has been possible to collect from the literature 12 instances in which the first clue to the presence of an intrathoracic terato-dermoid was furnished by the appearance of a visible swelling in the neck. In at least three other cases, Gordon (1827), Spath (1836) and Poehm (1871), such a tumour became obvious later in the course of the disease when other manifestations had brought the patient under observation. The report of two further cases which presented themselves with swelling in the neck is of interest as they throw some light on the aetiology of the condition.

Case 1

W.H., aet. 36, labourer. Complained of an unproductive cough which commenced in June 1946. In July 1944 the sternum had been bruised by a piece of shrapnel. He noticed a painless swelling in the right side of the neck in May 1947. There was no dyspnoea, haemoptysis, loss of weight or impairment of appetite.

Physical examination revealed a well-built, healthy man. A fixed mass 2 in. by 1 in. was situated deep to the middle of the right sternomastoid and extended from beneath the anterior margin of the muscle. It did not pulsate, was not fluctuant, failed to transilluminate and did not move on deglutition. Pressure on the swelling produced an irritating cough. There was no lymph node enlargement in the neck or axillae. The trachea was displaced to the left, the right pupil was slightly smaller than the left, but reaction to light and accommodation was normal. There was slight ptosis of the right upper eyelid. The blood pressure was equal in the two arms, 110/70 mm. Hg. The remainder of the physical examination revealed nothing of note.

Investigations. W.R.—negative. Blood sedimentation rate 3 mm. in one hour (Wintrobe). X-ray showed a rounded shadow in the superior mediastinum extending to the right hilum. The mass was displacing the trachea but not causing any gross oesophageal displacement. There was slight pulsation.

Operation; June 26, 1947. Under thiopentone, intratracheal gas, oxygen and ether, a collar incision was made in the neck one finger's breadth above the suprasternal notch. The strap muscles were divided and a cystic swelling was found extending upwards from the superior mediastinum behind the right lobe of the thyroid as far as the upper pole. Postero-medially it was related closely

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to the structures of the carotid sheath. It was completely encapsulated. The medial side of the capsule was adherent to the carotid sheath. The swelling was partly mobilized posteriorly by dividing its capsule, but it was not possible to insert a finger behind it into the superior mediastinum. By a combination of traction on the pedicle from above and the index finger hooked in front and below the mass it was delivered into the wound. The vascular pedicle was then divided. The specimen (Fig. 1) consisted of loose, very oedematous lining or lymphocytic infiltration. It was considered that this was a branchial cyst.

Case 2

L.T., act. 49. A housewife. Was admitted on August 5, 1947, complaining of cough and sputum for 14 months. Her past medical history was uneventful and the family history contained nothing relevant. She had no haemoptysis, stridor, hoarseness or dysphagia. Her weight was stationary and the appetite good.

areolar tissue containing numerous thin-walled vessels, some of which contained blood. Scattered throughout the section were several islands of osteoid tissue not yet calcified. There was no evidence of thyroid tissue. The tumour resembled a benign terato-dermoid.

On October 8, 1947, the patient was re-admitted for excision of the original swelling on the right side of the neck. A vertical incision was made over the middle third of the anterior border of sterno-mastoid. The swelling was situated deep to sterno-mastoid and extended from the level of the sixth cervical vertebra to the angle of the jaw. It was removed except for the portion attached to the carotid sheath. The patient had an uneventful convalescence.

Section consisted of a cyst lined by granulation tissue in which there was no evidence of epithelial

Fig. 1.—The specimen removed at operation.

Physical examination revealed a healthy woman who had telangiectasis on the face and enlarged veins in the neck and right side of the upper thorax. In the region of the right lobe of the thyroid there was a large nodular mass which extended into the superior mediastinum. It did not move on deglutition and its lower part was hard. The trachea was displaced to the left. The remainder of the examination was normal.

In investigations. X-ray of the chest and neck (Figs. 2 and 3) revealed a large soft tissue shadow projecting down into the mediastinum and more pronounced on the right side. There was depression and lateral displacement of the aorta. The trachea showed severe displacement to the left and considerable narrowing. Hb. was 86 per cent., white cells 8,900 per c.mm., neutrophils 75 per cent., lymphocytes 21 per cent., monocytes.
Fig. 2.—(Case 2.) X-ray of chest.

Fig. 3.—(Case 2.) Barium swallow; lateral view.

Fig. 4.—(Case 2.) The specimen removed.
2 per cent. and eosinophils 1 per cent. Electrocardiogram was normal.

**Operation; August 8, 1947.** The thyroid was exposed through a collar incision and found to be normal. A tense, encapsulated, pulsating swelling was seen extending up from the superior mediastinum and lying on the pre-vertebral muscles and cervical spine. The great vessels of the neck were situated postero-laterally. The thyroid and trachea were displaced to the left on its postero-superior surface. The pedicle was divided and ligated. The capsule was then opened and separated from the smooth surface of the swelling which was removed as in the preceding case.

The patient had an eventful convalescence. The tumour (Fig. 4) in the main part was composed of myxomatous fibrous tissue and vascular granulation tissue. In addition there were many large blood-filled sinuses which gave the section the appearance of a cavernous angioma. Scattered throughout the section were several islands of osteid tissue, not yet calcified. There was no evidence of malignancy.

**Discussion**

The pathogenesis of mediastinal terato-dermoids has been reviewed by Rusby, who concludes that each theory has its shortcomings. None fits all the facts and the final elucidation of this problem must be awaited. The monogerminal theory is more reasonable than the bigeminal. The explanation possibly lies in an abnormality of the third and fourth branchial arches, the abnormal cells being carried into the thorax by the normal descent of the heart and the great vessels. Cases 1 and 2 appear to corroborate this view in being located partly in the neck. The association of a branchial cyst and terato-dermoid in Case 1 appears to be significant, as branchial cysts probably take origin from abnormal remnants of the cervical sinus. The relationship between trauma and tumour is still sub judice.

The diagnosis of terato-dermoids from saccular aneurysm, retro-sternal goitre and thymoma is not always easy. Terato-dermoids may pulsate because of their close proximity to the heart and greater vessels. Sometimes they are extremely vascular.

Burrhill-Holmes (1934), discussing this subject, attaches little importance to pulsation, and remarks that in his experience pulsation of an aneurysmal sac is the exception rather than the rule. The fluoroscopic visualization of the whole length of the aorta, the clinical findings in the heart and the serological results of the blood examination are useful aids in helping to establish the diagnosis.

A retro-sternal goitre may so resemble a terato-dermoid as to render differential diagnosis indefinite until operation. The characteristic wedge-shaped opacity on X-ray is not always recognizable, and the elevation on swallowing is not always detected nor is it pathognomonic of substernal goitres. Calcification occurs in both and is no help in the diagnosis. Tracer studies with radioactive iodine will show the presence of a retro-sternal goitre provided it has not taken on malignant changes or been completely replaced by cystic degeneration (Ansell and Rotblat, 1948; Marcus, 1950).

Thymic tumours (Reid and Marcus, 1949) are suspected when there are symptoms of myasthenia gravis. Here a skiagram would show a shadow which, in the antero-posterior view, occupies the mediastinum to one or other side of the heart shadow and on a lateral view occupies the superior mediastinum above the heart.

The importance of terato-dermoids depends on the symptoms they produce from pressure and on the complications to which they are liable. They may, however, be symptomless and only be discovered on mass radiography or at post-mortem. Pressure symptoms resemble those of any mediastinal tumour. They are liable to secondary infection and may develop adhesions to neighbouring structures. Rupture may occur into a bronchus, a blood vessel or the pleura. Finally, degeneration and malignancy may supervene. For these reasons attempt at removal in suitable cases should always be contemplated.

**Summary**

Two cases of superior mediastinal terato-dermoids are reported. In one case the associated presence of a branchial cyst is of particular interest.
Superior Mediastinal Terato-Dermoids: (report of two cases)
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