LIPOTHYMOMA

A REPORT OF A CASE AND A REVIEW OF THE LITERATURE

BY

Lieut.-Colonel JOHN MACKAY-DICK, M.B., F.R.C.P.(Edin.)
Royal Army Medical Corps

G. KENT HARRISON, M.D.(Toronto), F.R.C.S.

AND

Captain N. G. ROTHNIE, M.B., B.S.(Lond.)
Royal Army Medical Corps

From the Connaught Hospital, Bramshott

LIPOTHYMOMA is a rare form of mediastinal tumour, and the occurrence of one at the Army Chest Centre prompted us to review the literature and to add this case.

A lipothymoma is a benign encapsulated tumour arising from the thymus in the anterior mediastinum and consisting of an admixture of thymic and adipose tissue. The term lipothymoma was coined by Houdard (1950) and later by Bigelow & Ehler (1952).

Clinically they have a variable presentation and symptomatology like mediastinal lipomas to which they are closely akin. On examination and radiologically they can be mistaken for pleural fluid; pulmonary atelectasis, cardiomegaly and pericardial effusion. They are not associated with any symptoms or signs of myasthenia. They undoubtedly arise in childhood or adolescence and because of their slow growth they can be found at any age and not, as stated by Rubin & Mishkin (1954), in children only.

CASE REPORT

Sgt. L. D., a 36-year-old regular soldier, decided to have a chest radiograph while his squad of recruits were being examined by a M.M.R. unit in June, 1954. This M.M.R. film showed a shadow at the right base.

On 26.6.54 he was admitted to the Army Chest Centre with a diagnosis of "right lower lobe collapse." He was completely symptomless and had no complaints referable to the chest. There was nothing relevant in his past or family histories. He had never suffered from any tropical diseases.

On examination he was a well-developed and fit-looking man. Except for dullness and diminished breath sounds at the right base, no physical abnormalities were found. There were no myasthenic symptoms or signs.

Routine investigations. E.S.R.=2 mm. in 1st hour (Westergren): blood count within normal limits: Mantoux 1 : 1,000 positive: sputum tests negative for A.A.F.B. on smear and culture: liver function tests normal and stools normal.

Radiographs. P.A. film showed a triangular-shaped shadow to the right of the heart with the base blending with the liver and right hemidiaphragmatic shadows. The apex blended with the superior mediastinum and laterally it extended to the right costo-phrenic angle. The lateral part of the shadow was less dense than the medial. A right lateral radiograph showed a dome-shaped shadow inferiorly giving the appearance of a raised right hemidiaphragm with no evidence of a collapsed right lower lobe. Screening showed sluggish movement in normal direction of the upper concave border of the shadow.

Right lateral tomography confirmed the appearances seen on the lateral film of an apparently raised right hemidiaphragm.

A right bronchogram with 60 per cent. dionosil revealed displacement and thinning of the right middle and lower lobe bronchi over the shadow. The main stem bronchi were normal and unobstructed.

Bronchoscopy (by Mr. Kent Harrison). There was displacement laterally and posteriorly of the basal bronchi on the right side. The bronchial tree was otherwise normal.

Diagnostic pneumoperitoneum. The mass was shown to be above the right hemidiaphragm with downward displacement of the latter.

A pre-operative diagnosis of mediastinal lipoma was made.

Operation on 31.8.54. A right postero-lateral thoracotomy exposed a large, encapsulated lobulated fatty mass occupying the medial and lower part of the right hemithorax. The right middle and lower lobes were compressed laterally by the tumour and were free from it. The mass was conical in shape with its base on the diaphragm and its apex extending as a pedicle into the superior mediastinum in front of the arch of the aorta. The pedicle contained blood-vessels which branched over the surface of the tumour beneath its covering of mediastinal pleura.

The tumour was easily mobilized from the diaphragm and pericardium and the pedicle divided between clamps. The large fatty tumour was then removed from the pleural cavity. The post-operative course was uneventful and under-water-seal drainage was required for 24 hours.

The chest radiograph one week after operation showed a triangular shadow in the right cardiophrenic angle. This "recurrence" of the shadow was probably due to a blood collection combined with delayed expansion of the lower and middle lobes which had been compressed for such a considerable period of time pre-operatively. This shadow gradually cleared over the next two weeks and the patient was fit for discharge from hospital.

Pathology (Dr. R. H. Thomlinson). "Macroscopic: A mass of fat measuring $22 \times 16 \times 6$ cm. and weighing 1,142 g. It is covered by a thin layer of fibrous tissue (pleura) in which there are blood-vessels. At one point larger vessels enter the mass of tissue. Microscopic: Four out of six histological preparations taken at random from the mass of fat contain thymus tissue. In one of these, from the region where the large blood-vessels enter the mass, there is marked hyperplasia of the thymus tissue but the different types of cell are in their normal proportions."

FIG. 1. P.A. radiograph of the chest during convalescence after the lipothymoma had been excised.

FIG. 2. Specimen removed at operation.

PLATE II

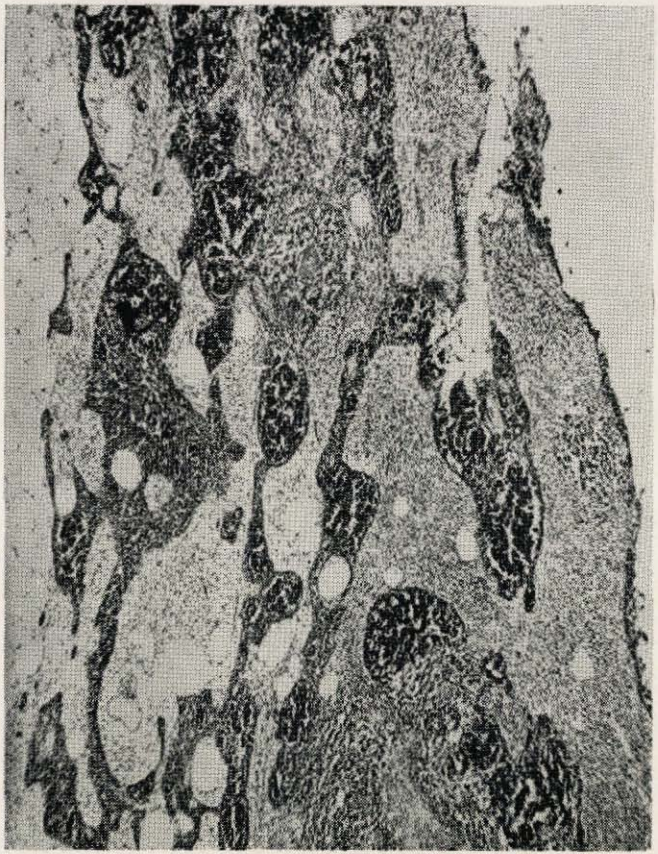

FIG. 1. Section of lesion showing Hassall's Corpuscles.

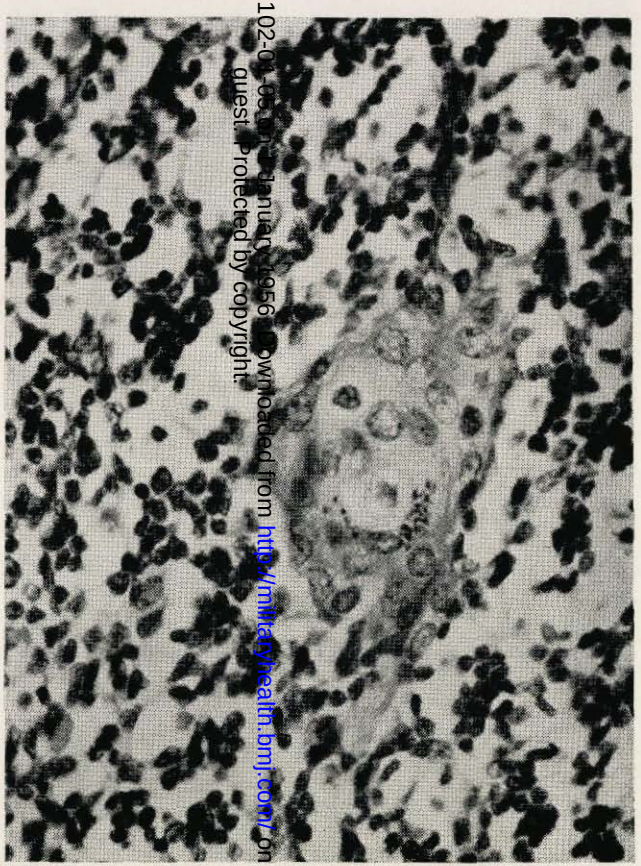

FIG. 2. Small area of section magnified to show a Hassall's Corpuscle to better advantage.

PLATE III

REVIEW OF REPORTED CASES

1. Andrus & Foot (1937) reported the first case in a boy of 13 with increasing dyspnœa and cough. A large encapsulated lobulated mass weighing 2,235 g. with a pedicle to the anterior mediastinum was successfully removed from the left hemithorax. Microscopy showed a mixture of adipose and thymic tissue.

2. Schanher & Hodge (1949) described a case in a woman aged 35 with exertional dyspnœa, orthopnœa when lying on the right side and a wheezy dry cough. A radiograph ten years previously had shown an "enlarged heart." At operation a tumour weighing 625 g. was removed from the right hemithorax. It was attached to the anterior mediastinum in front of the aortic arch by a pedicle. Histologically it was a lipoma with centrally placed thymic remnants.

3. Bariety & Coury (1950) found one in a woman of 40 complaining of exertional dyspnœa and persistent dry cough for three years. Radiography and bronchography suggested a neoplastic obstruction and atelectasis of the right middle lobe. At operation a fatty lobulated tumour with a pedicle to the concavity of the aorta in front of the superior vena cava was found. It weighed 350 g. and consisted of lipomatous tissue in the midst of which were areas of thymic tissue.

4. Bariety & Coury quote a case described by Houdard (1950) whose report is not available for study.

5. Bigelow & Ehler (1952) found this unusual benign tumour in a girl aged 10 with cough and hæmoptysis. A 170 g. encapsulated tumour attached to the thymic area of the anterior mediastinum was removed from the right chest. Histologically it showed an admixture of fat and thymic tissue.

6. Grosse (1953) quotes a case in a male aged 14 found on a routine radiograph. At operation a fatty tumour was removed from the left hemithorax and it extended down from the left lobe of the thymus. It consisted of thymus and fat.

7. Rubin & Mishkin (1954) described one in a girl aged 19 with right chest pain on exertion and increasing dyspnœa. A radiograph at 14 years showed an "enlarged heart." An encapsulated lobulated mass with a pedicle to the thymic region was removed from the right chest at operation. The tumour weighed 750 g. and contained an admixture of thymus and fat.

DISCUSSION

These cases and the one here reported have certain features in common. Lipothymomas arise in early life and in either sex and may be discovered at any age, as the process of involution does not eradicate all traces of thymic tissue but only reduces its amount. This will be shown by a study of the normal histology at varying ages.

They may be found on routine radiography or because of the symptoms of compression, *e.g.*, a dry, irritating cough and increasing exertional dyspnœa. In no case was there evidence of myasthenia. On radiography in all cases, the shadows were noted to be less dense peripherally and to be continuous with the

cardiac and diaphragmatic shadows. The intrathoracic position of the tumour can be confirmed by a diagnostic pneumoperitoneum and its extrapulmonary nature by bronchography and bronchoscopy. Pleuroscopy in one of the cases reviewed appeared to be of little help and in another angiocardiography was used.

At operation in all cases a lobulated mass of fat arising by a pedicle from the thymic area of the anterior mediastinum was found. Macroscopically the tumours had the typical appearance of a lipoma and on microscopy they contained thymic and adipose tissue in varying proportions. The younger the case the greater the amount of thymic tissue present. There was no evidence of malignancy in any of the cases.

A brief study of the normal development and histology of the thymus at varying ages helps in solving some of the problems of the pathogenesis and age incidence of these rare tumours and their possible relationship to mediastinal lipomas. The thymus is developed from the endoderm of the third bronchial pouch and migrates downwards through the superior mediastinum to its normal position in the anterior mediastinum in front of the aortic arch. Thymic rests may occur along this migration route and these may give rise to cervico-mediastinal and superior mediastinal thymic tumours.

Histologically the thymus at various age periods has the following features (after Hammar, 1921):

1. Childhood (0-10 years)—Abundant parenchyma and sparse connective tissue.
2. Puberty (11-15 years)—Abundant parenchyma and wider septa of connective tissue.
3. Youth (16-20 years)—Reduction in parenchyma and broader strands of connective tissue and adipose tissue.
4. Adult (21-45 years)—Strands of parenchyma and connective tissue with much adipose tissue.
5. Old age (45 onwards)—Patchy parenchyma.

Briefly, then, the histological age pattern shows a gradual decrease in thymic parenchyma after puberty with an increase in adipose and connective tissue. Between the ages of 6 and 12 the thymus is at its maximum size; two-thirds consists of parenchyma, the rest of connective tissue and fat. After this the total size gradually decreases. At 20 years about half is parenchymatous and half fat and connective tissue, and between 30 and 40 years only about one-quarter to one-eighth is parenchymatous (Boyd, 1936).

This normal process of thymic involution occurs in lipothymomas and explains why the thymic elements are less marked in the older age group and may only be present as remnants in the pedicle or centre of the tumour. They can and do occur in adult life and not only in children, though they have probably originated in early life.

A mediastinal lipoma probably arises from the adipose tissue of the thymus and may originate as a lipothymoma which, when it undergoes involution of the thymic element, leaves the fatty element persisting a sa lipoma (Rubin &

Mishkin, 1954). It may be, however, that if these lipomas were thoroughly examined microscopically, thymic elements would be found in varying amounts according to age. These mediastinal lipomas would in reality be lipothymomas.

These tumours may be localized to the thymic area or in the superior mediastinum, but because of their slow insidious growth over many years they have increased beyond these bounds when first seen. Fat is semifluid at body temperature and therefore gravity influences its further growth downwards along the side of the mediastinum, moulding itself to the heart and diaphragm and so giving it its typical appearance at operation.

Treatment can be dealt with very briefly and consists of excision because of compression effects. In no case was there evidence of malignancy, but the possibility of this in a deep-seated lipoma must be kept in mind.

SUMMARY

A case of lipothymoma is added to a review of the literature of these rare tumours, which are found at any age.

Their clinical features and radiological characteristics have been described.

By a comparison and study of the pathology of these benign neoplasms with the normal histology of thymic involution, tumours showing remnants of thymic tissue, occurring usually in adults, are included under the term lipothymoma. This term is therefore not reserved purely for tumours showing an admixture of thymic and fatty tissue.

Their close relationship to mediastinal lipomas and the possibility that some of these may well contain thymic remnants is discussed.

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