

## Clinical and other Notes.

### NOTES ON A CASE OF INTRATHORACIC NEW GROWTH.

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THE patient, aged 24, a soldier of the Northumberland Fusiliers, was admitted from Newcastle on January 6, 1925, with a diagnosis of N.Y.D. lung, sarcoma? The notes on the case were accompanied by an excellent radiograph.

The patient had been hit by a full-sized brick thrown at him by a native during a fracas at a railway station in India on November 14, 1924, whilst boarding a troop train for home, which caused a bruising of the front of the left side of his chest. He did not report sick.

On his way home on the boat he reported sick with a swelling over the ribs below the left collar bone and a pain down the left arm.

On admission to York Military Hospital on January 6, 1925, the patient was found to be a very well developed man. He complained of a swelling about the size of a dessert spoon over the second rib on the left side about  $2\frac{1}{2}$  inches long in the long axis of the rib and 2 inches broad and about 2 inches from the left edge of the sternum. It was tender to touch and did not pulsate. There was dullness on percussion over both the front and back of the chest with absence of normal breath sounds. A few rhonchi were heard. There was some enlargement of the axillary and supraclavicular glands on the left side, together with shooting pains and numbness down the left arm. There was also considerable expectoration of tenacious mucus, the patient giving a history of chronic catarrh for years back, in India and at home. Sputum, negative to T.B., pulse 80, temperature normal. No history of venereal disease.

The radiograph showed a dense shadow the size of two fists, completely filling the left apex of the pleural cavity. The tumour did not appear to be connected with the ribs. The right side of the chest appeared normal.

This case aroused a very considerable amount of interest amongst the hospital staff as regards the diagnosis.

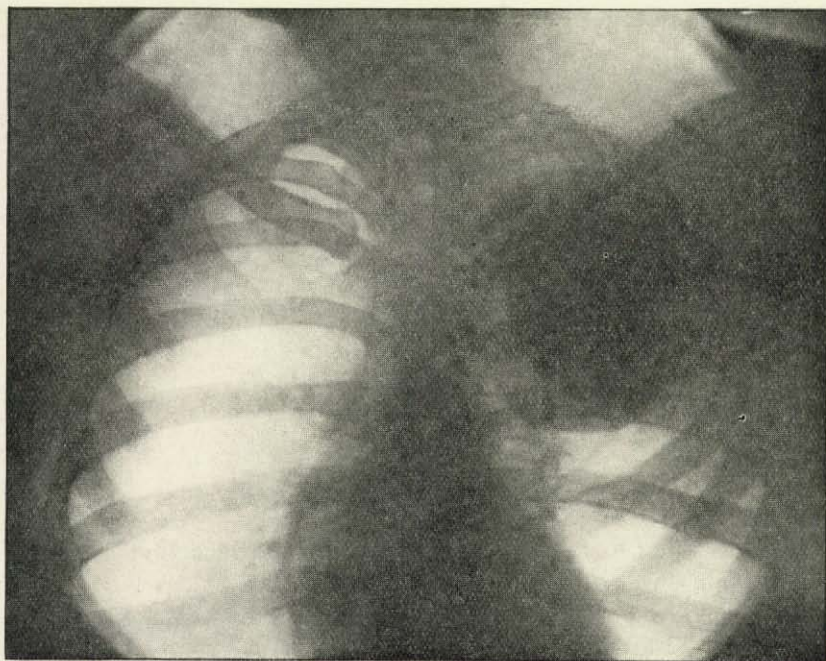
The alternative diagnosis to malignant new growth apparently lay between:—

(1) Fractured rib with a large ossifying hæmatoma reflecting the pleura from the ribs and filling the apex of the pleural cavity together with hyperplasia of the axillary glands.

(2) Abscess, with glandular enlargements. In support of this there was an occasional rise of temperature to 99° F. The differential blood-count was found to be 73 per cent neutrophiles, 23 per cent lymphocytes,

2 per cent eosinophiles, 2 per cent large mononuclears. It was decided to aspirate the tumour and so determine its constitution, 10 oz. of unaltered blood of a venous character were withdrawn with no difficulty. The patient appeared to be considerably relieved by this operation. Respiration 24/28, temperature normal. Pain down the arm lessened. A radiogram showed the shadow still present with a possible diminution in density.

About fourteen days after the aspiration it was noticed that the left pupil was considerably contracted, pain down the arm became worse, necessitating morphia. The chest tumour enlarged rapidly and blue veins coursed over it in a tortuous manner.



On February 13, 1925, the Consultant Surgeon was asked to see this case and exploratory operation was decided on forthwith.

A 6-inch incision in the direction of the fibres of the pectoral muscles was made over the tumour of the chest. Portions of a friable tumour were removed exposing eroded rib, some pus-like hyaline fluid escaped when exploring in the direction of the axilla. At the floor of the excavated masses between the intercostal spaces, a hard resistant intrathoracic mass was felt which it was considered precluded further operative interference. Considerable hæmorrhage was experienced and with difficulty controlled. Two disintegrating glands were removed from the axilla and the wound was sewn up.

After the operation the patient was anæmic; he coughed up large

quantities of bloody sputum. Temperature rose to 101° F., pulse 100/120, and respiration 24/30. Pain down the arm became worse daily. A tumour of elastic consistency was noticed on the forehead on the right side; this tumour increased very rapidly in size, indeed it was possible to watch its daily growth.

Patient now complained of loss of power in the right leg, together with difficulty in micturition. Within three days both legs and the bladder became paralysed, together with abdominal stasis and complete anæsthesia below the umbilicus. The operation wound had healed in ten days, but there was brawny hardening and increased involvement of the supra-clavicular glands and axillary glands with œdema of shoulder and neck. Breathing became rapidly embarrassed and patient died with signs of œdema of lungs on March 5, 1925.

Portions of the growth removed at the operation were submitted to the Royal Army Medical College and the report given below was received:—

#### POST-MORTEM EXAMINATION.

Body of a well nourished adult showing healed scars in the left pectoral region, the result of recent surgical operation. A diffuse, brawny, indurated swelling of the subcutaneous tissue was seen and felt in the same region, extending also outwards into the axillary and upwards into the supra-clavicular regions.

Another well-defined subcutaneous swelling, about the size of a tangerine orange, over which the skin could be moved freely, was present in the upper right frontal region. No other sign of disease noted externally.

#### THORAX.

On removal of the sternum and adjoining costal cartilages, a left-sided pleural effusion of about one-and-a-half pints of clear straw-coloured fluid was found. The superior mediastinum was found to be completely filled with a large solid lobulated mass of growth and continuous with a similar mass of pinkish white growth in the upper part of the left thorax and completely obliterating any signs of lung tissue in this situation.

On further reflection of the pectoral muscles, together with the skin and subcutaneous tissue of the left side, the mass of growth noted above was found to be continuous with a similar new growth found outside the thorax. The second left rib and the intercostal muscles of the spaces above and below the rib anteriorly were found to be incorporated in the growth, and there was very little normal bony rib tissue to be found for an inch or two lateral to the costo-chondral junction.

The pectoral muscles were also extensively infiltrated, and the growth was found to extend in a continuous mass into the axilla as far as the axillary vessels and cords of the brachial plexus and also upwards into the supra-clavicular region.

On examining the left lung *in situ*, the lower lobe and the lower part of the upper lobe, unaffected by the growth, were found to be in a collapsed state. The apex and upper part of the upper lobe, laterally and posteriorly were adherent to the chest wall by pleural adhesions. As already noted, the lung anteriorly was completely obliterated by new growth and medially it was not possible to separate the upper lobe from the supra-mediastinum on account of the continuity of the growth in this direction.

The right lung was found to be normal, with the exception of a small secondary nodule situated near the anterior margin of the lower lobe.

On removal of the lungs the new growth on the left side was found to consist of a large mass of softish, pinkish-white or yellow, semi-friable material, with bands of fibrous-looking tissue disposed in a radiating manner throughout the mass. The lung tissue of the upper anterior aspect, as well as the apex of the left upper lobe was found to have been invaded and almost completely replaced by the growth, a small portion of the lung remaining posteriorly.

Secondary deposits of new growths were found in the following situations:—

- (a) Right lung, as noted above.
- (b) Inferior margin of right lobe of liver.
- (c) Spine in the neighbourhood of the tenth dorsal vertebra.
- (d) Scalp, in the upper part of right frontal region.

The secondary deposits in the lung and liver were small rounded nodules situated superficially. The deposit in the frontal region was found to be a rounded, whitish, soft mass, not adherent to the skin, and easily shelled out from the scalp tissue, but adherent to the underlying bone by a small pedicle or stalk. On removal of the portion of the bone affected, by trephining, the pedicle or stalk was found to have grown through the bone, and on subsequently removing the skull cap the growth externally was found to be connected with a similar growth internally involving the dura mater.

The growth in this situation was more or less flattened and diffused and covered an area of about one and a half inches in extent. The under surface showed one or two nodules growing downwards toward the brain, depressing, but not involving the latter. The deposit in connexion with the spine was seen to form a small swelling from within the abdomen on the left side of the spinal column and between the posterior ends of the ninth and tenth costal arches. On dissection the tumour was found to consist of the same white, softish material noted in the other secondary deposits, and to be growing outwards from an intervertebral foramen along the course of the spinal thoracic nerve. The bodies of the vertebræ and surrounding bony structure appeared to be healthy. No other secondary deposits were found elsewhere. The spleen, pancreas, and kidneys and gastro-intestinal organs were all found to be healthy with the exception of the appendix, which was bound to the cæcum by old adhesions. The

pelvic organs were normal and no abnormality was found in the brain, with the exception of the growth in the dura mater, already noted.

REPORT FROM THE ROYAL ARMY MEDICAL COLLEGE.

The following are the conditions found in the three portions of tissue submitted for examination.

(1) This consists in the main of a fairly dense fibrous stroma, throughout which are scattered sheets of cells mainly of a polyhedral shape, and strongly resembling the cells of the deeper layers of the epithelium. The nuclei of these cells are large, rich in chromatin, and in a fair number of cases show mitotic figures.

At certain points the arrangement changes. The fibrous tissue becomes less dense, and is arranged in a meshwork of strands. The spaces thus formed are lined with endothelium, and in these spaces are collections of cells which are more loosely arranged than those in the first part described. The majority of these cells are round with scanty cytoplasm and dense nuclei, resembling a lymphatic type of cell. Cells of the polyhedral type are however also present in these spaces, and show a tendency here and there to be arranged round small light-staining circular collections of cells like tiny "pearls" or "cell nests."

In some places the polyhedral cells have an alveolar arrangement, with a core of the round cells.

(2) This shows a portion of muscle being invaded by the new growth. The infiltration is intense. The cells are in some parts spindle-shaped, with comparatively light staining nuclei. In other places quantities of the round cells are massed together. There is a tendency towards the arrangement of the cells in whorls. A fair amount of hæmorrhage is present, and blood-vessels are of a primitive type. In places quantities of deeply stained fibrin are to be seen.

(3) This has the external characters of a gland as suggested, and presumably is a gland, but no typical tissue by which it may be definitely labelled as such is left.

It consists of a reticulum of loose fibrous tissue, forming a meshwork, the spaces of which are lined with endothelium.

Hæmorrhage is a conspicuous feature, having taken place partly into the substance of the fibrous tissue, and partly into the endothelium-lined spaces.

The spaces are in the main, however, filled with plugs of cells of the two types described. The largest plugs are of the small round cells, but there is no lack of small plugs of the polyhedral cells. In some places the plugs are lying quite free in the spaces. In other places the dissociation from the endothelium is not so conspicuous. Some of the plugs consist of both types of cells intermingled.

## CONCLUSIONS.

(1) There can be no doubt as to the malignancy of the tumour. The type of cell, the invasion of muscle, the glandular involvement, the hæmorrhages and the vessels are all sufficient to make that point quite definite.

(2) The origin of the tumour is by no means so definite. Taking the first portion of tissue described as representing the tumour mass, the amount of stroma, the type of the cells, and the masses of cells lying in the spaces are by no means suggestive of sarcoma.

The epithelial type of the cells, the general distribution, the stroma formation are all suggestive of carcinoma. On the other hand the situation of the tumour, in a locality where there is no epithelial tissue, and the absence of any primary focus in epithelial tissue, leaves this very doubtful.

There remains the possibility of an endothelioma.

Muir says that if growths having the structural arrangement of a cancer occur in regions where there is no epithelium, one may be justified in using the term endothelioma in reference to them. Borst describes a case originating in the pleura, which penetrated the chest wall. In this "pearls" were present, and the cells strongly resembled epithelial cells. Ewing casts doubts on this being an endothelioma. In the present case the nuclei have certainly not the vesicular character common in endothelioma. Nevertheless it seems most probable that this tumour is of the nature of an endothelioma, probably taking origin in the pleura and penetrating the chest wall.

A radiogram showing the dense shadow of the growth accompanies these notes.

A rough sketch in oils of the lungs was made after removal at the post-mortem examination.

This case is considered of interest on account of :—

- (a) The comparative rarity of the disease.
- (b) The great rapidity of the growth of the tumour, and especially the rapid growth of the secondary deposits.
- (c) The question as to whether the cancerous growth was caused by the blow by the brick.
- (d) The difficulty in detecting the site of origin.

My thanks are due to Colonel F. J. Brakenridge, C.M.G., and Lieutenant-Colonel J. H. R. Winder, D.S.O., for permission to publish this case, and also to Captain J. S. K. Boyd, for his very interesting pathological report, and to Major E. G. Anthonisz, for his report on the post-mortem findings.