LEUKAEMOID RE-ACTION IN BRONCHOGENIC CARCINOMA

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Krumbhaar¹ introduced the term 'leukaemoid' to denote an abnormal peripheral blood picture resembling myeloid or lymphatic leukaemia in a variety of non-leukaemic conditions.

We report a case of bronchogenic carcinoma which had metastasized to lymph nodes, adrenal glands and bones with a severe leukaemoid reaction. The leucocyte count reached 110,000 per c.mm. (91 per cent. were mature neutrophil granulocytes).

Case Report

A man, aged 54 years, was admitted to hospital on 7.1.56, complaining of a productive cough and repeated attacks of haemoptysis for four weeks.

On examination he was a well-nourished, alert man. The temperature was 100°F., pulse rate 110 per minute and respiration 28 per minute, while the blood pressure was 120/80 and the electrocardiogram was normal. There were signs of complete collapse of the left lung. No other physical abnormality was detected. An X-ray of the chest confirmed total collapse of the left lung and on fluoroscopy the left diaphragm was paralysed. The angiocardigram (Fig. 1) clearly outlined the first inch of the left pulmonary artery. Beyond this the artery was invaded and obliterated by the growth. Bronchoscopy showed that the left main bronchus was obstructed by a polypoid growth about 2.5 cm. from the carina. On 9.1.56 peripheral blood examination showed Hb. 12.8 g./100 ml., R.B.C.s 4.4 m./c.mm., W.B.C.s 23,000/c.mm. (n. polymorphs 80 per cent., lymphocytes 14 per cent., monocytes 6 per cent.).

Left radical pneumonectomy (B.S.D.) was carried out on 12.1.56. A large growth occupying almost the entire left upper lobe, invading the pericardium and left pulmonary artery, was seen. Histological examination (Fig. 2) confirmed bronchial carcinoma (pleomorphic, undifferentiated growth, consisting of large polygonal cells with many tumour giant cells and mitotic figures). The left pulmonary artery was infiltrated by the tumour which projected into the lumen. Eight bronchial lymph nodes were sectioned; tumour invading the fat

FIG. 1.—Angiocardiogram showing invasion of the left pulmonary artery about 1 in. from its original.

surrounding one node was seen, but there were no deposits in the nodes themselves.

His post-operative progress was smooth and he was discharged from the hospital on 30.1.56. He was seen in the follow-up clinic on 10.2.56, when he appeared to be progressing satisfactorily.

On 26.2.56 he was readmitted with pyrexia of unknown origin and pain in the cervical spine for two days. On examination he appeared seriously ill with a temperature of 102°F. and a pulse rate of 110 per minute. No abnormal physical signs were detected in the right lung, the heart sounds were normal and the blood pressure was 110/70. A

FIG. 2.—Histology low power. Carcinoma of the lungs. $\times 52$.

small tender node was found in the left cervical region and a small mass was palpable in the left lumbar region. An X-ray of the chest showed fluid in the left hemithorax, which is usual after pneumonectomy. The fluid was aspirated and was sterile on bacteriological examination.

The haematological data throughout his illness is shown in Table 1.

A cervical lymph node biopsy was performed on 4.3.56. Microscopic examination of the node showed complete replacement by anaplastic carcinoma with the same features as the primary in the bronchus. On 12.3.56 sternal marrow puncture was performed. The marrow smear was reported on by Dr. Blackburn as follows:

'Smears are very cellular. Erythron is normoblastic and micro-normoblastic with some megaloid cells. Leucon shows a marked chronic granulocytic reaction, apparently of malignant type. Thrombon is well represented. No carcinoma cells seen.'

He concluded that it was consistent with chronic myeloid leukaemia plus iron deficiency. The provisional diagnosis of synchronous double malignancy, chronic myeloid leukaemia and multiple secondary deposits from the bronchial carcinoma was made.

FIG. 3.—Bone marrow smear. High power. $\times 52$.

On 13.3.56 myleran therapy (4 mg. daily by mouth) was begun. The retro-peritoneal mass in the left lumbar region, which was just palpable at the time of his readmission on 26.2.56, increased rapidly in size and was larger than a foetal head at the time of his death (23.3.56). About 10 hours before his death the patient suddenly collapsed with progressive peripheral circulatory failure; he became delirious and developed involuntary limb movements. This episode was suggestive of adrenal apoplexy.

Post-Mortem Examination (Dr. O. C. Dodge)

The immediate cause of death was massive haemorrhage into the right adrenal gland. The left adrenal gland was not identified. The kidneys were normal, the left ilio-psoas muscle was replaced by massive secondary deposits and the lymph nodes along the abdominal aorta, iliac vessels showed soft white tumour deposits. The liver showed no abnormality and the spleen showed two firm white nodules about 1 cm. in diameter. Microscopic examination showed that there was no leukaemic infiltration of the kidneys, spleen or liver, the bone marrow was infiltrated with bronchial carcinoma cells and the two nodules in the spleen had the

TABLE I

1956	Feb. 27	March 5	March 8	March 12	March 15	March 17
R.B.C.s (n./c.mm.)	4.3	4.2	—	3.0	3.3	—
Hb. (g. 100 ml.)	13.5	12.3	—	9.3	10.1	10.7
W.B.C.s (n./c.mm.)	30,000	70,000	100,000	100,000	110,000	110,000
N. polymorphs (%)	87	81	90	87	90	91
Eosinophils (%)	—	2	—	—	—	—
Band cells (%)	9	5	3	1	4	5
N. myelocytes (%)	—	—	—	1	1	1
Lymphocytes (%)	4	7	3	7	3	3
Monocytes (%)	—	5	4	4	2	—
Platelet (thousands per c.mm.) (Lemport)	—	220	—	200	200	—

same histological picture as the primary bronchial carcinoma.

Discussion

Hinshaw *et al.*² have reported a case of severe leukaemoid reaction associated with bronchogenic carcinoma; the leucocyte count reached 144,000 and majority of the cells were mature granulocytes. Several observers have reported leukaemoid blood picture in association with malignancy.^{3, 4, 5} In our patient the diagnosis of leukaemia could not be excluded until the histological examination of the organs at autopsy. Hill *et al.*⁶ have discussed the problem of leukaemoid reactions and have made several useful suggestions in arriving at the correct diagnosis during life.

This case also illustrates the value of angiocardiology in assessing operability of the carcinoma lung.

Summary

A case of carcinoma lung with severe leukaemoid reaction is reported. The absence of leukaemic infiltration in kidney, liver and spleen differentiated the condition from true leukaemia.

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