

the posterior wall of the ventricle and the interventricular septum revealed diffuse fibrosis of the myocardium.

The aortic valve was normal; the aorta showed minimal atheroma. The coronary arteries were explored and found to be thin-walled and patent throughout, with no areas of atheroma, thrombosis or embolism.

The peritoneal cavity contained about 700 c.c. of yellowish free fluid. There were a few adhesions binding the cæcum and omentum to the abdominal parietes. The stomach was congested, with a very small pyloric antrum. The liver was enlarged and nut-meg in appearance. One kidney contained a grape-sized cyst. The bladder was notable for the presence of submucosal varices. The cervix of the uterus showed a greenish exudate. Both common and external iliac veins contained thrombi, partly adherent to the vein wall.

The skeletal and nervous systems were not examined. Microscopically the heart showed myocardial hypertrophy with focal areas of necrosis in which were seen a few lymphocytes and mononuclears; near these areas there were fragmented swollen myocardial fibres in which were seen swollen nuclei. There was a fresh acute and a partially organized thrombus on the endocardium of left ventricle. In some areas there was a marked scarring of myocardium with fibrosis.

Other organs showed only chronic congestive changes. The lung sections showed the effects of multiple emboli from the thrombophlebitis noted clinically.

The pathological findings here were consistent with those described in the literature concerning this condition. In the heart the findings resembled those described by others although in the focal lesions there were no neutrophile or eosinophile polymorphonuclear leucocytes. The mural thrombosis in the left ventricle apparently was secondary to the myocardial damage. The arteriolar sclerosis noted in the kidneys in some cases was absent but there were some congestive changes.

The features of post-partum heart disease which may be emphasized are its onset within six weeks following delivery, with congestive failure usually manifested, the frequency of pain in the chest suggesting coronary insufficiency; episodes of embolism, mainly pulmonary; the varying degree of hypertension; the non-specific and relatively constant abnormalities in the electrocardiogram; the resistance to usual methods of treatment; and the usually good prognosis.

The case reported differed somewhat in having a low blood pressure, with low pulse pressure, and in terminating fatally.

#### SUMMARY

A case of post-partum heart disease is presented. It is probable that she had episodes of cardiac damage following the birth of her last three children, in 1939, 1947 and 1948. Following the last child she developed congestive heart failure and died five months postpartum. At autopsy the apical half of the left ventricle

and interventricular septum was largely replaced by scar tissue with some evidence microscopically of recent necrosis and subacute inflammation. The coronary arteries were normal.

The cause of this condition is unknown.

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### METASTASIS OF BRONCHOGENIC CARCINOMA TO THE THUMB

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Some malignant diseases are notorious in giving rise to their secondary deposits in diverse and unusual situations. Primary carcinoma of the bronchus is such a tumour. When one is faced during the performance of one's routine duties with an example of such tumour behaviour there is occasioned much surprise and even incredulity.

The following is a case record we considered worthy of publishing as an example of a most unusual manner in which carcinoma of a bronchus presented itself.

The patient, a male, aged 59 years, a clerk, was referred to one of us (E.F.R.) on November 13, 1948. His only complaint was of a sore right thumb. He stated that he had twisted the thumb three weeks previously whilst lifting a heavy transfer case. Pain and swelling occurred three or four days later. During the succeeding weeks the skin became reddened and an intractable throbbing pain gradually increased in intensity. On examination the thumb presented a diffuse swelling particularly over the proximal phalanx, accompanied by local heat and tenderness. There was nowhere a breach of the skin surface. All the clinical findings suggested an inflammatory process.

X-ray examination of the hand revealed a marked destruction of the proximal phalanx of the thumb (Fig. 1). The patient was admitted to the Halifax Infirmary, where on the basis of an inflammatory bone lesion, intramuscular penicillin, in doses of 20,000 units every four hours, was given for three days. There was no clinical response to this therapy.

An aspiration needle was inserted and only a few drops of blood were obtained. On November 19, 1948, under general anaesthesia, and employing tourniquet control, a medial incision exposed obvious tumour tissue. There was an apparent encapsulation, yet it could not be shelled out like a benign tumour and it had not the appearance of an osteoclastoma or a giant-cell synovioma. The tumour was removed by curette as thoroughly as possible, leaving a shell of bone distally and on the lateral side. The wound was closed, and a pressure dressing beneath a moulded plaster splint, was applied. The wound healed by primary intention.

Pathological examination of the curetted tissue revealed an epidermoid carcinoma of a large basal-cell rather than a plexiform squamous type (Fig. 2). However, an occasional cell nest structure was seen. Many

small cystic spaces were ringed by several layers of very uniform tumour cells. The growth was entirely osteolytic, though its vascularity was poor. The stroma was acellular and composed of coarsely reticulated fibrous tissue showing no evidence of new or dead bone or osteoid matrix. The growth was pronounced as a secondary tumour invading the proximal phalanx of the thumb and the suggested primary site was bronchial epithelium.

After a discussion upon the histological findings a very detailed history was taken and a thorough clinical search was made for evidence of a primary neoplasm. No single new complaint was elicited. An x-ray examination of the chest on November 25, 1948, revealed evi-

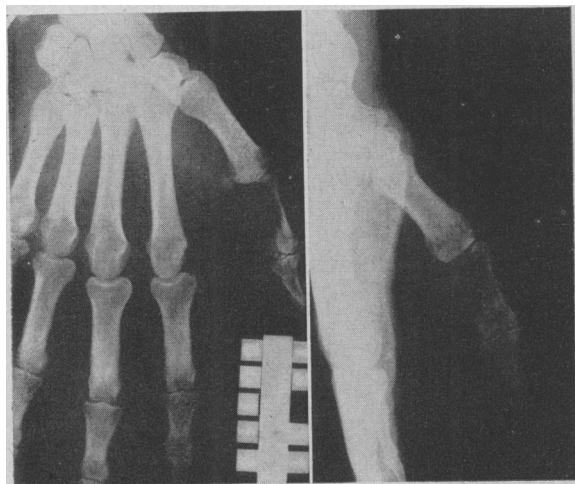


Fig. 1.—Radiograph of the thumb prior to first operation.

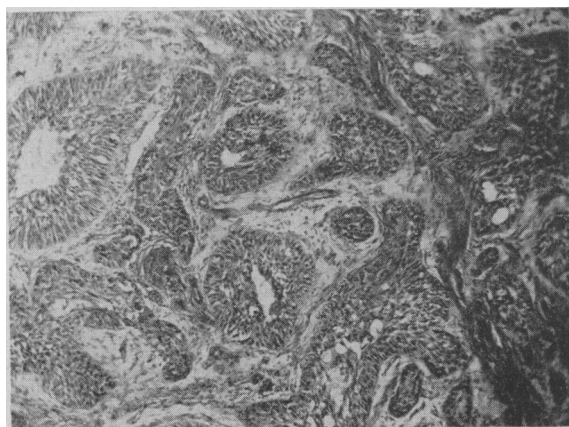


Fig. 2.—Microscopic appearances of the tumour removed from the thumb.

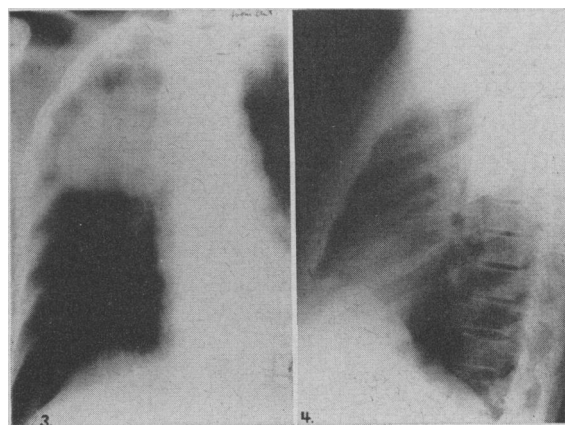
dence of an area of collapse involving the apical segment of the right upper lobe. The interlobar fissure was curved upwards, and the heart and mediastinum showed slight displacement to the right. The left lung was clear. Dr. C. J. Beckwith examined the patient and noted in his report that there had been no complaint of symptomatology of any type, subjectively or objectively during the past year. There was slight dullness to percussion and some rhonchi high in the right axilla. A fluoroscopic examination of the chest revealed a well-marked density above the third rib more sharply defined than in the previous x-ray film. Planographs were taken and are reproduced in Figs. 3 and 4.

A bronchoscopic examination was carried out at the Victoria General Hospital by Dr. D. M. MacRae. It showed a normal right main bronchus but the right upper

lobe orifice could not be directly visualized due to retraction, nor could the main bronchus be displaced with the bronchoscope to permit visualization of the upper lobe bronchus because of the fixity of structures in this region. Specimens of secretion were taken and slides prepared for staining by Papanicolaou's technique. The microscopical appearances of the bronchial smears revealed many malignant cells in all stages of mitotic division and many others showing degenerative changes. It was impossible to be certain of the histological type of neoplasm from these smears.

The clinical progress and the subsequent treatment of the patient were as follows: On December 27, there was recurrence of the swelling of the right thumb and he was again admitted to the Victoria General Hospital where on December 30, the right thumb and metacarpal bone were removed at the carpo-metacarpal articulation to prevent an ulcerating lesion of the thumb. This wound has healed primarily and there has been no evidence of any local recurrence since that time.

The patient has gradually gone down hill and now has developed a metastasis at the left sterno-clavicular joint and has had two minor episodes of hæmoptysis. The present picture is that of rapidly advancing malignancy of the lung.



Figs. 3 and 4.—Anterior and lateral x-ray planograph views of the lung tumour.

#### DISCUSSION

This is a further recorded example of the unusual manner in which a bronchial carcinoma may make itself manifest. Other reported cases of an identical nature are very few. Smither and Price<sup>1</sup> described a case of primary bronchial carcinoma with a metastasis in a terminal phalanx. There was a painful and fluctuant swelling suggesting a whitlow, and it was by aspiration biopsy that an anaplastic squamous carcinoma was diagnosed. Colson and Willcox<sup>2</sup> reported three cases of phalangeal metastases in bronchogenic carcinoma. In one of their cases such a secondary deposit was, as in our own case, the presenting symptom. In all three cases the phalangeal metastases clinically resembled an inflammation and were initially assumed to be due to a paronychia or whitlow. Willis<sup>3</sup> states that secondary growths in the digits are very rare

and refers to two such reported cases of metacarpal and phalangeal metastases respectively. He goes on to say that these metastatic tumours are osteolytic and destructive, often causing pathological fractures and often invading surrounding soft tissues. They may also show pulsation and be mistaken for aneurysms.

In our own case we could only conjecture whether the twisting injury initially complained of had actually played any part in the arrest and growth of tumour emboli in this unusual situation, or whether such an injury was coincidental and minor, being mentally magnified in retrospect when the swelling of the thumb developed.

#### SUMMARY

A case of asymptomatic bronchial carcinoma in a male aged 59 years is reported, which manifested its presence by metastasizing to the proximal phalanx of the right thumb and there giving rise to the symptoms and signs of an inflammatory bone lesion.

NOTE.—Since the submission of this paper we have to report the death of the patient. No autopsy was obtained.

We wish to thank Dr. C. J. Beckwith, Medical Superintendent of the Halifax Tuberculosis Hospital, Dr. D. M. MacRae and Dr. R. L. Smith of the Victoria General Hospital, and Dr. C. M. Jones of the Halifax Infirmary for their kind co-operation and skilful assistance in the investigation of this case.

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## SPECIAL ARTICLE

### LIVER FUNCTION TESTS\*

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One of the outstanding developments in medicine during the last thirty years has been the rapid increase in the use of laboratory tests as aids to diagnosis and therapy. Many have proved so useful that medical practitioners regard them with a degree of confidence previously reserved for symptoms and physical signs. This is not true of liver function tests, which provoke in the minds of many practitioners nothing more than confusion. This

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leads to haphazard use, inspired chiefly by eagerness to try out every new test in the hope that it may prove better than the last. The purpose of this article is to point out that at least some of this confusion can be avoided if a rational plan is followed in the use of liver function tests.

It would be absurd to suggest that all confusion can be dispelled and the subject made simple by laying down a few general rules. The liver is a complex organ, performing a wide variety of functions. It is therefore not surprising to find that between thirty and forty liver function tests are in common use. Liver functions show a marked degree of dissociation. Some functions may be disturbed while others remain apparently unimpaired. This has discouraged dependence on a few tests only and has led to the use of "batteries" of tests. The functional capacity of the liver far exceeds normal needs. Function tests may therefore be disappointing in revealing no impairment in spite of the presence of disease.

These difficulties will be readily admitted by the most enthusiastic advocate of liver function tests. But it must also be recognized that confusion in this field cannot be attributed entirely to the inherent functional complexity and capacity of the human liver. There is an obvious tendency to needlessly increase confusion by failure to adopt any plan in the use of these tests. It is suggested that the following approach may prove helpful.

1. *Decide what type of information is required from liver function tests.*

There is no single test which is suitable for all purposes. Selection must be made on the basis of the type of information required. It follows that thorough investigation of the clinical aspects of the case and the problems involved must precede any decision regarding the use of liver function tests.

2. *Select tests on basis of type of information required.*

Three types of information may be obtained from tests of liver function. First, they may be used to detect liver damage. Examples of tests suitable for this purpose are the estimation of bilirubin in plasma, estimation of urobilinogen in urine, detection of bilirubin in urine, cephalin flocculation test and bromsulphalein test. Second, tests may be used to estimate the degree of impairment of function. Examples of tests suitable for this purpose are the estimation of bilirubin in plasma, estimation of urobilinogen in urine and bromsulphalein test. Third, tests may be used in cases of jaundice to aid in distinguishing between biliary obstruction and hepatic parenchymal damage. Examples of tests suitable for this purpose are the estimation of alkaline phosphatase in serum, estimation of cholesterol in plasma and galactose tolerance test.