

REPORT OF A CASE AND AN ANALYSIS OF TWENTY-TWO CASES OF BRONCHO- GENIC CARCINOMATA*

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THE following case came to the out-door department of Sir J. J. Hospital and was subsequently under my care in the wards of the hospital. It was diagnosed tentatively as 'sarcoma of the scalp', but at the *post-mortem* examination it was discovered to be a secondary deposit from a carcinoma of the left bronchus.

A Hindu male, aged 35 years, reported at the out-door department of Sir J. J. Hospital, complaining of a swelling on the back of his head. He stated that five months ago, *i.e.*, in January 1938, he noticed a small nodular swelling in the occipital region. At that time it was painless and so he did not pay any attention to it, but during the two following months the nodule had grown in size and had become slightly painful. He therefore went to a hakim and had the tumour cut by him—some time in February 1938. As a result of this treatment, the nodule instead of subsiding began to grow with greater vigour, until it had attained its present size. During these past three months, while it had been growing in size, it had become ulcerated in places and painful, and had begun to discharge what the patient described as pus and serum. The patient had been suffering from cough and fever for the last one month only.

Examination.—There is a large swelling on the back of the head occupying the whole of the occipital and part of the parietal regions on both sides (figure 1). Approximately, the size of the tumour is 8 inches by 8 inches and it is raised for about 4 inches above the surface of the head. The surface of the tumour is nodular over its greater extent and in this area the growth is raw-looking and ulcerated in places. The ulcerated surface is discharging pus and seropurulent material, and blood is seen to ooze out of a few of the ulcerated spots. In some places the area shows adherent sloughs. On more detailed examination each nodule appears to be studded on its exposed surface with coarse large granulations. The remaining part of the growth is covered with scalp which is normal in some places and undermined in others. In this region a few dilated veins can be seen.

On palpation, the feel of the growth varies in different parts. In some places, it is firm while in the area immediately surrounding the raw-looking nodular surface it is fluctuating, especially in both the parietal regions. The ulcerated and raw-looking surface is friable. The whole growth has a superficial mobility and gives the impression that it is adherent to the underlying bone. There are no palpable lymph nodes.

* A part of this paper was read before a meeting of the 'Teaching Pathologists', Bombay.

(Continued from previous page)

NAPIER, L. E., and DAS *Indian J. Med. Res.*, **23**,
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455 and 973; **24**, 85 and
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Clinical examination of the lungs.—No impaired note on percussion, no bronchial breathing, but râles and rhonchi are present as adventitious sounds. Liver and spleen are not enlarged. The general condition of the patient is emaciated and toxic-looking. The patient was admitted for further investigation.

Clinical diagnosis.—Fungating sarcoma of the scalp. Under local anaesthesia a biopsy was performed. There was smart bleeding from the cut edge of the tumour which was checked by diathermy coagulation and firm pressure. *Report of tissue examination:*—'Loose texture, abundant lymph spaces, few epithelial

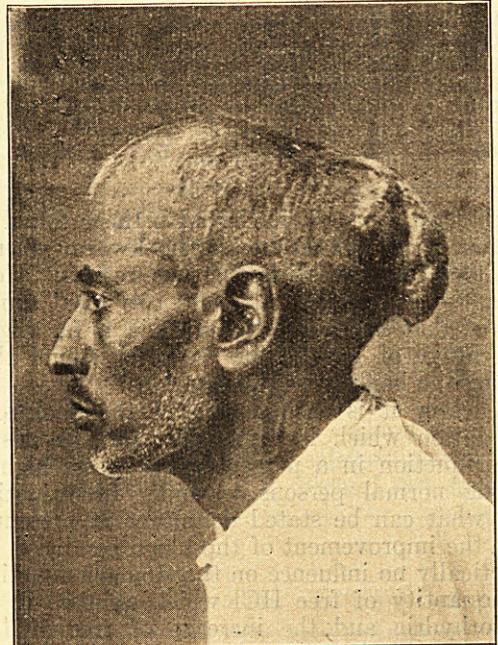


Fig. 1.

pearls. The greater bulk is connective tissue malignant tumour'.

Other investigations:—

Wassermann reaction—Negative.

Urine examination—

Albumin present.

Bence-Jones proteins absent.

Pus cells and red cells present.

Blood examination—

Red cells .. 2,400,000 per c.mm.

Leucocytes .. 6,000 " "

Differential count—

Polymorphonuclears .. 76 per cent.

Lymphocytes .. 18 " "

Eosinophils .. 3 " "

X-ray photographs—

(a) Skull—'Malignant tumour eroding posterior part of skull' (figure 2).

(b) Lungs—'Secondaries ribs and lungs'.

From the time of his admission, his general condition gradually grew worse every day, and in view of his general condition and the x-ray findings it was decided that the neoplasm had advanced too far to institute any curative or even palliative line of treatment. His pain and other discomforts were relieved with morphia. The patient died on 20th June, 1938.

Post-mortem report.—The body is that of a male aged about 45 years, considerably emaciated. There is a growth in the occipital region

about the size of an orange, ulcerated on the surface, nodular, and having a raw appearance. On opening the skull the growth is seen to have destroyed a greater part of the occipital bone below the occipital prominence, and to have pressed inwards the dura underlying this part.

Right lung—shows a few sub-pleural cellular nodules. Compensatory emphysema is seen at the margins of both lungs, but more prominent in the right lung.

Left lung—shows two abscess cavities one below the other at the apical region. The walls of the cavities are irregular and the contents muco-purulent. Near the hilum one of the bronchi shows infiltration, blocking its lumen.



Fig. 2.

Liver—shows a large growth at the right lobe, the size of a cricket ball. The growth is cellular with yellowish streaking along its surface. Two other small nodules are seen in the lower portion.

Left kidney—shows an irregular cellular growth on its convex margin about the middle, snow white in colour.

Right suprarenal—shows a nodule at its apex.

Stomach.—Normal.

Spleen.—Not enlarged, capsule thickened at places, and shows a calcified plaque in the capsule.

Other organs.—Normal.

Histological report of sections from post-mortem tissues

Three sections of lungs.—Two sections of the wall of the suspected tuberculous cavities show exuberant granulation tissue. No tumour cells detected. There is an exuberant growth of epithelioid tissue as well as tuberculous bronchopneumonia, with areas of caseation.

The third section shows sheets of large round or oval cells, irregular in shape, as well as narrower strands of the same situated more proximally, while there is an adenomatous proliferation of the same cells more distally. No evidence of tubercle.

On section of lymph gland (mediastinal, with bronchial cartilage and mucous glands).—One gland shows caseating tubercle while another shows marked congestion and hæmorrhage and partial disorganization of the architecture. No metastatic deposits.

One section of liver.—It shows secondary deposits: irregular sheets and strands. The pattern of the proliferation is not adenomatous.

One section of suprarenal.—More of adenomatous proliferation, less of irregular strands and sheets.

Earlier cases

A detailed study of the above case prompted me to look into the past records of the pathology department, Sir J. J. Hospital, of cases of tumours, particularly bronchogenic carcinomata, arising primarily in the thoracic cavity. By this is meant to include only those tumours which arise from the intra-thoracic respiratory organs and other tissues, excluding however the œsophagus, cardiac end of the stomach, heart and the pericardium.

The total number of cases is thirty, from the year 1886 to December 1938. Prior to 1886 there is a record of only one case mentioned in the catalogue of 1879 which runs as follows: 'Scirrhous tumour surrounding the lower end of the trachea and the commencement of the bronchi. The patient suffered from urgent dyspnoea and died of asphyxia'.

Histological sections cannot be traced of any of the cases that occurred between 1886 to 1908, nor is the material available for making fresh microscopic preparations. The information about these cases which number eleven is therefore obtained from recorded notes only. From 1908 to 1925 no case of intra-thoracic tumour is found in the *post-mortem* records of this period.

Out of the thirty cases, twenty-two are carcinomata, six are sarcomata, one is a hæmangioma of the pleura, and one gumma. For purposes of analysis all cases other than those of carcinoma are omitted, and the twenty-two cases of carcinoma which are analysed have apparently all arisen primarily from intra-thoracic portion of the respiratory tract—bronchogenic carcinomata.

It is fully realized that the number of cases is too small to draw any far-reaching conclusions; also in addition the recording of some of the cases is very incomplete. The total number of thirty cases is divided into the following three chronological groups:—

	Number of cases	Carcinomata
1. From 1886 to 1908 ..	12	9
2. From 1926 to 1937 ..	14	10
3. From Jan. to Dec. 1938	4	3
	—	—
TOTAL ..	30	22

Group I. 1886 to 1908

	Date	Sex	Age	Clinical history	Right lung	Left lung	Liver	Kidney	Bone or brain	Glands
(1)	11-9-1886	M.	48	Cough, pain in the abdomen, right lumbar and iliac regions. Attacks of hæmoptysis occasionally 2 months ago. Enlarged liver and swelling of ribs.	Lower half broken down and upper consolidated.	Infiltrated with growth.	Several large tumour masses.	..	..	Lumbar; growth in small intestine near ileocolic valve.
(2)	20-2-1887	M.	30	Sudden loss of power of right side.	Multiple nodules.	Multiple nodules.	..	Multiple nodules.	Multiple nodules in brain.	..
(3)	29-4-1892	M.	35	Painful swelling of the neck for five months and troublesome cough.	Two nodules.	..	..	..	..	Bronchial.
(4)	1-2-1898	M.	30	Clinical history not available.	..	Solid. Covered with pleurisy. Infiltrating nodules in base. Left bronchus stenosed.	Several nodules.	..	..	Posterior mediastinal.
(5)	31-3-1901	M.	50	Complaint of hæmoptysis.	Growth	Growth	..	Growth one kidney.	..	Gland in neck.
(6)	8-4-1905	M.	50	Fever, cough, pain behind the sternum and hepatic region. Sudden attack of paralysis.	Base	..	..	..	Left hemisphere just above Sylvian fissure.	At bifurcation of trachea and mesenteric.
(7)	28-6-1905	M.	40	Clinical history not available.	..	Bronchus	Nodule	Nodule in one kidney.	Spine and skull.	..
(8)	17-7-1908	M.	30	Clinical history not available.	Apex	..	..	..	..	Posterior mediastinal.
(9)	13-11-1908	M.	30	Cough and fever, pain and dullness in the chest.	Root of lung.	..	..	..	..	..

Group II. 1926 to 1937

(1)	12-2-1926	M.	30	Ill for 3 years. Pain left lumbar region for 1 year. Lump in left kidney region. Pain in chest 3 years. Sinus in region of left 4th rib. Dullness on left side of chest. Clinical diagnosis of primary lung tumour and secondary in the left kidney.	Right pleural sac.	Left pleural sac and pericardium, bronchus.	Nodule	Nodules in both kidneys.	..	Pelvic peritoneum.
(2)	20-6-1927	M.	37	Gradual dysphagia for 2 months. Hoarseness of voice, foetid breath and sputum. No physical signs of aneurysm. X-ray shows shadow pressing on the œsophagus.	A lump between the œsophagus and trachea and at the bifurcation of the trachea.	..	..	..	..	..
(3)	6-10-1930	M.	50	Cough with muco-purulent expectoration. Loss of power of right half of the face.	Right lung	..	..	..	Surface of cerebellum.	..

Group II. 1926 to 1937—concl'd.

	Date	Sex	Age	Clinical history	Right lung	Left lung	Liver	Kidney	Bone or brain	Glands
(4)	29-12-1933	M.	50	Frequency of stools for 3 months. No blood or mucus. Pain in right hip; sprain 3 months ago. Marked wasting of gluteal muscles. Hip movements possible but painful. Thickening of ileum and greater trochanter. Clinical diagnosis Ewing's tumour.	New growth in bronchus extending from hilum into the right lung.	..	..	..	Ribs, vertebrae, skull and iliac bones.	..
(5)	24-1-1934	M.	35	Multiple sinuses in both groins. Difficulty in micturition. Prepuce and glans penis sloughed off.	..	Lung and bronchus. Bronchiectasis.	..	..	..	Glands both sides.
(6)	20-3-1935	M.	60	Severe pain in chest for 3 months.	Hilum tubercle infection.	..	..	..	Brain and meninges.	..
(7)	28-9-1935	M.	45	Clinical history not available.	Nodule in bronchus.	..	Many nodules.	..	..	Bronchial lymph glands.
(8)	12-6-1936	M.	18	Frequent stools 3 months. Macular syphilis 3 months.	..	Soft fleshy lump.	..	..	..	..
(9)	21-4-1937	M.	45	Unconscious with convulsions. Right sided hemiplegia, no conjunctival reflex, pupils react sluggishly.	Bronchus	Bronchus	Multiple nodules.	..	Skull and brain.	Large lump on left side of neck.
(10)	29-6-1937	M.	48	Pain all over for 2 months. Tubular breathing left side; interspaces sunken, clubbing of fingers.	..	Near the base.	..	..	..	..

Group III. 1938

(1)	23-4-1938	M.	45	Irregular fever 1 month. Cough. Pain in the chest when coughing. Diminished movements left side. Blood stained sputum. Vocal resonance diminished.	..	Infiltrated, also bronchus.	Nodule	Nodule in left kidney.	Brain	Glands near the head of the pancreas.
(2)	20-6-1938	M.	35	Cough with expectoration. Pain in chest both sides. Low fever for 5 months. Cough is unceasing.	Bronchus and pleura and tuberculous infection.	..	..	..	Brain	Bronchial glands.
(3)	31-6-1938	M.	35	Fungating growth scalp, occipital region. Cough and fever 1 month. Clinical diagnosis—sarcoma scalp. X-ray—eroded skull and secondaries in lungs.	..	Left bronchus and tuberculous infection.	Large mass.	Nodule and in supra-renal.	Skull	Bronchial glands.

Analysis

1. All the twenty-two cases occurred in males.

2. Clinical history is available in eighteen cases out of which thirteen cases, *i.e.*, about 72 per cent, manifested signs or symptoms or both

which could be definitely referred to an intrathoracic disease; and out of these again 66.6 per cent complained of cough.

3. As regards the age incidence, 50 per cent of cases in this series occurred between the ages of 30 to 40 years and 40.9 per cent between the

ages of 40 to 50 years. In the series published by Brines and Kenning (1937) only 14.8 per cent occurred between the ages of 30 to 40 years and 26.4 per cent between the ages of 40 to 50 years. In the series published by Frissell and Knox (1937) only 10.8 per cent and 13 per cent occurred between the ages of 30 to 40 years and 40 to 50 years respectively. On taking the age period of 30 to 50 years in the writer's series 91 per cent of cases occurred in this age period.

4. In this series the right side appears to be more commonly affected than the left—54.5 per cent and 45.5 per cent. In statistics of 3,735 cases published by Fischer, 53 per cent occurred on the right side and 45 per cent on the left side.

5. As regards metastases in this series 77.2 per cent of cases had secondary deposits in one or more parts of the body. In the series published by Fischer, 80 per cent of cases had secondary deposits.

6. Of all the places in the body as sites of secondary deposits, the liver is found to be the commonest—36.3 per cent of cases, the next common site being the brain 31.8 per cent; and out of those cases which had secondary deposits in the brain more than 50 per cent exhibited signs referable to central nervous lesion.

7. Bones in themselves do not appear to be common as sites of secondary deposits, but out of all the bones, skull bones are those which are most commonly affected—in every case in this series whenever there were secondary deposits in the bones.

8. Association of tuberculous infection is found to be present in three cases.

Pathological and histological comments

Of the twelve cases—of intra-thoracic tumours—recorded from 1886 to 1908, three are sarcomata and the remaining nine are bronchogenic carcinomata, as judged from the study of recorded notes. One of these nine cases is histologically diagnosed as 'alveolar sarcoma'.

Of the eighteen cases recorded from 1926 to 1938, five are non-epithelial in origin: one a cavernous hæmangioma of the pleura, another a lympho-sarcoma of the mediastinal glands, two others are spindle-celled sarcomata of the lung, and one a sarcoma of the ribs. The remaining thirteen are carcinomata of the lungs, eleven hilar, one apical and one peripheral—all bronchogenic in origin, except the last which has a texture of an adenocarcinoma of the lung parenchyma. Of the eleven hilar, two are columnar-celled adenocarcinomata, one a columnar-celled carcinoma, one a mixed-spheroidal and columnar-celled type with few areas of adenomatous texture; three are stratified squamous epithelial in type, and about the remaining two the cell type cannot be clearly determined. The apical one is a spheroidal cell carcinoma and the peripheral one an adenocarcinoma. The associated tumour of the penis in one of these cases is a squamous-celled

carcinoma with secondary deposits in the inguinal glands on both sides.

Metastatic deposits recorded in the nine cases are seen to have bred true in all but one case—the one which was sent to the pathologist as a biopsy piece with a clinical diagnosis of a primary sarcoma of the scalp—the case described in detail at the beginning of this paper. This showed extreme differentiation, exhibiting the morphology of a rapidly-growing connective tissue spindle-celled mass with stray epithelial pearls. The growth later turned out to be a secondary deposit from a spheroidal and columnar-celled bronchogenic carcinoma with adenomatous proliferation in places. The epithelial pearls were apparently of local origin.

The association of tuberculous infection in three of these cases is verified.

Donald Owen, T. H. Hewer and P. H. Whitker draw attention to a statement made by Geschlechter and Denison that bronchogenic carcinomata can be rigidly divided into two classes: (1) those arising at the hilum which are squamous, basal-cell or oat-cell in type; and (2) those arising at the periphery of the lung which are adeno-columnar, adeno-mucoid, or adeno-cubical. Their study of twenty cases of hilar carcinomata does not warrant such a clear-cut finding. The analysis of the above thirteen cases lends support to their contention.

Analysis in percentages.—Total number of cases 22.

	Per cent.
1. Right side involvement in 12 cases	.. 54.5
2. Left side involvement in 10 cases	.. 45.5
3. Both sides involved in 4 cases	.. 18.1
4. Secondary deposits in the liver in 8 cases	36.3
5. Secondary deposits in the brain in 7 cases	31.8
6. Secondary deposits in the kidney in 6 cases	27.2
7. Secondary deposits in the bones in 4 cases	18.1
8. Secondary deposits in the pleura in 1 case	4.5
9. Secondary deposits in the peritoneum in 1 case	4.5
10. Secondary deposits in the intestines in 1 case	.. 4.5

It is noteworthy that regarding secondary deposits in the bones, skull bones are involved in all the four cases, in some cases in addition to other bones.

Conclusions

1. The disease occurs in males.
2. The highest age incidence is between 30 to 50 years.
3. A large number of cases manifest signs or symptoms referable to an intra-thoracic lesion of which cough is the most prominent symptom.
4. A very large number of cases give rise to secondary deposits of which the commonest site is the liver, the next common site being the brain.
5. When secondary deposits occur in the bones, skull bones are the sites of choice.
6. The right side is slightly more commonly affected than the left.

(Concluded on opposite page)

AN ANALYSIS OF 356 CASES OF ENTERIC FEVER TREATED IN THE KING EDWARD MEMORIAL HOSPITAL, SECUNDERABAD, DECCAN

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THOUGH enteric fever is prevalent in Secunderabad every year and continues throughout the year, it broke out in an epidemic form about the end of August last year, and during its two months' virulence it carried away a good many young adults. The rush to the K. E. M. Hospital, Secunderabad, at that time was so great that a wing of the surgical section was utilized to accommodate the enteric cases.

The total number of cases treated was 356, out of which 284 were cured and 72 died, which included 19 cases admitted moribund and died within 24 hours and 6 cases within 72 hours.

The method of examination

As a routine all patients admitted for fever are examined for malaria and blood taken for

(Continued from previous page)

Summary

1. One case of bronchogenic carcinoma which had come under the writer's personal observation is described in detail.
2. All the records available in the pathology department of Sir J. J. Hospital of cases of bronchogenic carcinomata are reviewed.
3. The twenty-two cases are divided into three chronological groups.
4. All cases are analysed in a table and regarding some points a comparative view is given.
5. Conclusions arrived at from a study of these cases are given.

Acknowledgments

I must thank Prof. P. V. Gharpure for giving me facilities and all the necessary help during the search of these records. I am indebted to Dr. J. L. Saldhana, assistant professor of pathology, who has entirely written the histological section of this paper. I have also to thank the radiologist and the hospital artist for supplying copies of the radiograms and photographs. I must also thank the Superintendent, Sir J. J. group of hospitals, for allowing me to publish the case records.

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culture and Widal test. In this series the result was as follows:—

Blood for malarial parasites negative in all cases	
Blood culture positive for enteric group of fevers	26
Widal positive for <i>B. typhosus</i> (see table I)	218
Widal positive for <i>B. paratyphosus A</i>	9
Blood culture, repeated Widal and agglutination tests for <i>Proteus X</i> and <i>Brucella</i> group of organisms negative, but clinically enteric type	83
Not taken	20

TABLE I
Widal reaction

Titre ..	1 : 125	1 : 250	1 : 500	1 : 5,000	Total
<i>B. typhosus</i>	40	47	23	108	218
<i>B. paratyphosus A.</i>	2	1	1	5	9
TOTAL ..					227

General management

Absolute rest in bed, position is changed at frequent intervals, regulation of diet and careful nursing to prevent complications. Symptoms are treated as they arise. The temperature and pulse are charted four hourly. If the temperature rises above 103.5°F. the patient is given cold sponging and ice applied to the head. The body is sponged once daily. Special attention is paid to the skin, the back and pressure points being treated with spirit and powder twice daily.

The diet aimed at in this hospital is one consisting of *not less* than 2,500 calories. The patient gets 3 pints of buffalo milk, one pint coffee, one pint tea, two ounces glucose, two ounces sugar, eight ounces soup and juice of two lemons. Patients are allowed to supplement their hospital diet with one ounce of honey, one ounce cream, juice of six oranges or sweet limes, eight ounces of buttermilk and plain milk chocolate. Paying ward patients get in addition cream-soup, Chivers jelly and custard. Between feeds patients are encouraged to drink plenty of water. Those who can afford it are given in addition pure vitamin C in tablet form and some proprietary preparations containing vitamins A, B and D in liquid form. Solid food is allowed after the temperature has been normal for ten days and five days later if everything goes on well the patient is discharged. The above-mentioned diet could not be given to serious cases and nasal feeding had to be resorted to.

Treatment

Most of the patients were given a diaphoretic mixture. In a few cases septanilam was tried without beneficial result. Some patients were given oil of cinnamon only and it was noticed