obtained with more refined fluorescent antisera, but it should be borne in mind that a coating of antibody derived from the patient may block specific fluorescence.

**SUMMARY**

Bacterium-like structures were seen in renal casts in the urine from eight patients with pyelonephritis and from two with glomerulonephritis. Although these structures were morphologically identical with bacteria, an attempt to demonstrate their nature with fluorescent antisera was unsuccessful.

Most of this work was performed in the Radcliffe Infirmary, Oxford, and I am grateful to the clinical staff there for access to their patients and case records.

**REFERENCES**


**BRAIN ABSCESS DUE TO TRICHOSPORON CUTANEUM**

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**PLATE XIII**

There is increasing awareness amongst clinicians and microbiologists of the importance of infection by "opportunistic" bacterial, fungal or viral organisms. The patient described here had a brain abscess complicating a secondary deposit from a primary bronchial carcinoma; the fungus _Trichosporon cutaneum_ was cultured from the abscess contents. We know of no previously recorded association of this organism with cerebral abscess. Although it is a recognised cause of white piedra of hair and occasional nail infections, it is not known to have other pathogenic roles in man.

**CASE HISTORY**

A. M., an African woman aged 39 yr, was admitted to King Edward VIII Hospital, Durban, from a peripheral hospital, with a 3-wk history of progressive weakness of the right side of the body. A chest radiograph taken at the latter hospital revealed a right-sided hilar mass, and a skull radiograph showed calcification of the falx cerebri, which was central in position.

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CLINICAL FINDINGS

On examination, the patient was fully conscious and afebrile, and appeared to understand
the nature of questions put to her, although she was dysarthric. Relevant clinical findings
related mainly to the central nervous system. Motor power was diminished in right arm and
right leg and she showed right 5th and 7th nerve palsies. There was no increase in tone on the
right side. Sensory loss to pain and light touch was demonstrable on the right side of the
face, right arm and right leg and right side of the body. The deep reflexes were increased on
the right side; the abdominal reflexes were absent on that side and a right extensor plantar
response was detected.

Other positive findings of note were a minor degree of deviation of the trachea to the right
side and an enlarged solitary lymph-node on the right side of the neck. There was also a
large mobile irregular mass arising from the pelvis.

A clinical diagnosis of bronchial neoplasm with metastatic deposits in the brain, and a
fibroid of the uterus, was made, although the possibility of an ovarian neoplasm could not
be excluded.

RESULTS OF FURTHER INVESTIGATIONS

On admission to King Edward Hospital a second skull radiograph was taken. This was
3 wk after the first radiograph and showed extensive shift of the calcified falx cerebri to the
right side.

Examination of the blood revealed a haemoglobin value of 13.4 g per 100 ml and a total
leucocyte count of 6000 per µl with normal differential count. The Wassermann reaction
was negative. Cerebrospinal fluid was under increased pressure, but no chemical or cellular
abnormalities were detected and cultures were sterile.

In spite of the hilar mass, cytological examination of the sputum failed to reveal malignant
cells and biopsy of the enlarged lymph-node in the neck showed only non-specific lymph-
adenitis.

A brain scan was performed with technetium-99m and a lesion in the left parietal area
was demonstrated.

Bronchoscopy showed that the hilar mass was a large tumour arising from the right
intermediate bronchus.

Surgical intervention was contra-indicated by these findings. The patient’s condition
deteriorated rapidly and she died 4 wk after admission.

NECROPSY FINDINGS

The salient post-mortem findings were (a) considerable emaciation (weight 100 lb., i.e.,
45 kg); (b) a well-circumscribed yellowish-white solid tumour approximately $5\times5 \times 4$ cm
present in the hilar region of the right lung; and (c) secondary tumour deposits in the brain.
The latter consisted of an extensive cystic swelling located in the left cerebral hemisphere
and mainly involving the frontoparietal region, a smaller area of necrosis and cavitation in
the right internal capsule and in the region of the basal ganglion, and a gelatinous lesion in the
right cerebellar hemisphere. In addition, a calcified cysticercus lesion was found in the left
occipital lobe. There were small petechial haemorrhages in the brain-stem. The falx cerebri
showed osseous metaplasia.

No secondary lesions were found in any other tissue.

The histological appearances of the lung tumour were those of an adenocarcinoma of
the bronchus with many areas of tumour necrosis and infiltration with polymorphonuclear
cells.

Histologically the brain lesions show metastatic deposits. In addition, at the periphery
of these areas are large numbers of small (2–5 µm) round, deeply staining basophilic bodies
resembling yeast-phase structures (figure). These occur both singly and in clusters, the latter
ranging in size from 10 to 40 µm. Many of the clusters show a pale structureless central zone.
Occasional filaments resembling hyphae were also observed. There is infiltration of necrotic
TRICHOSPORON CUTANEUM BRAIN ABSCESS

FIGURE.—Brain. Area of metastatic deposits with collections of deeply staining basophilic bodies resembling fungal elements in the yeast phase. Haematoxylin and eosin. ×720.
areas with polymorphonuclear leucocytes and eosinophils. The basophilic bodies were
PAS-negative and no similar structures could be found in the lung sections.
There was a large calcified subserous fibromyoma of the uterus.

MYCOLOGICAL FINDINGS

No fungal elements were observed in direct microscopical preparations of pus from the
brain abscess. However, culture on Sabouraud’s glucose agar at 25°C yielded a soft cream-
coloured colony within a few days and this later became wrinkled and grey. Microscopical
preparations demonstrated septate hyphae with numerous arthrospores.
Further identification of the fungus was kindly undertaken at the Commonwealth
Mycological Institute, Kew, by Miss P. M. Stockdale. The organism produced blastospores
as well as arthrospores. This property and the results of biochemical tests indicated that the
isolate was Trichosporon cutaneum.
Repeated mycological cultures from the lung tumour failed to grow a similar organism,
but yielded a scanty growth of Candida albicans.

DISCUSSION

Trichosporon cutaneum species is a member of the subfamily Trichosporoideae in the
family Cryptococcaceae. A normal inhabitant of the soil, it may be found on occasion on
human skin as part of the normal flora and may cause finger-nail infection. It is also a cause
of white piedra which is more commonly associated with Trichosporon beigelii. This condition
occurs not uncommonly in temperate zones and has been recorded in Europe, Britain and
Japan as well as in tropical zones of South America.
The increasing importance of opportunistic infection by fungi is well documented in the
Ciba Foundation Symposium on Systemic Mycoses (Baker, 1968). Apart from occasional
examples that occur de novo, opportunistic mycoses fall into three categories according to
the major precipitating factors, namely (1) those associated with other diseases; (2) those
arising as complications of drug therapy, either resulting from alterations of normal
bacterial flora, e.g., by antibiotic therapy, or from the depression of immune function by
cytotoxic agents; and (3) those associated with either hypogammaglobulinaemia or
dysimmunoglobulinaemia. The use of immuno-suppressive drugs in transplant surgery
and in treatment of auto-immune disease is likely to bring further unusual pathogens to our
notice.

SUMMARY

Trichosporon cutaneum, the causative organism of white piedra, was isolated from a brain
abscess superimposed on as eondary metastatic deposit from a bronchial adenocarcinoma.

We are indebted to Mr A. Johnston and Miss P. M. Stockdale of the Commonwealth
Mycological Institute, Kew, for their assistance in identifying the fungus, and to Dr I. G.
Murray, School of Hygiene and Tropical Medicine, London, who confirmed the identifica-
tion at Miss Stockdale’s request.

REFERENCE

by G. E. W. Wolstenholme and Ruth