

# Tumours in ancient Egypt

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## Aim



- To consider tumours in ancient Egypt in the context of expectation of life, the contemporary environment and lifestyle of the people.

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swelling or tumour

Tumours in this paper are confined to benign and malignant neoplasms.

shefut

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swelling

Hieroglyphics from Nunn JF *Ancient Egyptian Medicine*  
London:British Museum Press, 1996.(pp217 and 225)

*Table 1 Dynasties of Ancient Egypt and the equivalent time periods (after Manetho)*

<b>Dynasty</b>	<b>Period</b>	<b>Approx Date BC</b>
I-II	Archaic	3168-2705
III-VI	Old Kingdom	2705-2250
VII-X	1st Intermediate	2250-2035
XI-XIII	Middle Kingdom	2035-1668
XIV-XVII	2nd Intermediate	1720-1550
XVIII-XX	New Kingdom	1550-1070
XXI-XXXI	Late Period	1070-332
Ptolemaic	Greek Period	332-30
Emperors	Roman Period	30 BC-395 AD

From: Sullivan R, *JRSM*, 1995; **88**: 141-145.

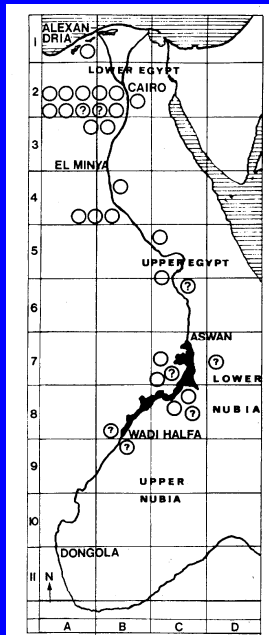


Figure 1 : Geographical distribution of tumor diseases. ○ archeological site not exactly located.

Where have tumours been found?

This map of Upper and Lower Egypt is from Pahl WM, *Int. J. Anthropol.* 1986; 1: 267-276.



**Table 5.1 :**

Distribution of tumours in different historical periods.

Chronology	3000 B.C. – 500 A.D.					
	2000 Years	1500 Years				
Historical Period	Archaic Period	Old : Middle : New Kingdom	Late : Christian Period			
Number of Cases	1	5	4	4	19	6
Total	14			25		

Courtesy of Professor Pahl, University of Tubingen.

From Ebeid N.I. *Egyptian Medicine in the Days of the Pharaohs.* Cairo: General Egyptian Book Organisation, 1999. (p.115)

## Possible reasons why few tumours have been found

- People in ancient Egypt died young (36 years was believed to be the mean age at death).
- The evidence is mainly from bones, few soft tissues being available for study.
- Many common cancers of the modern westernised world would be infrequent then.

## Nasopharyngeal carcinoma



FIG. 1.  
Perforations in the vault can be seen in at least seven places. Another is clearly seen in the left zygoma.

- Skull of male 30-35 years-of age, 3<sup>rd</sup>-5<sup>th</sup> Dynasty.

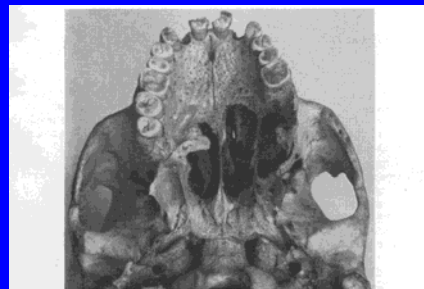


FIG. 4.  
This shows destruction by the primary growth of the left pterygoid laminae, the posterior wall of the antrum and the left half of the palate and alveolus. Secondary infective osteitis surrounds the primary lesion.

From: Wells C, *J.Laryn.Oto*, 1963

## Nasopharyngeal carcinoma

267 The cranial base of a 40–50-year-old male destroyed by the invasive growth of a nasopharyngeal carcinoma. Cemetery at Naga el-Deir. 6–12th dynasties. Berkeley, Robert H. Lowrie Museum of Anthropology

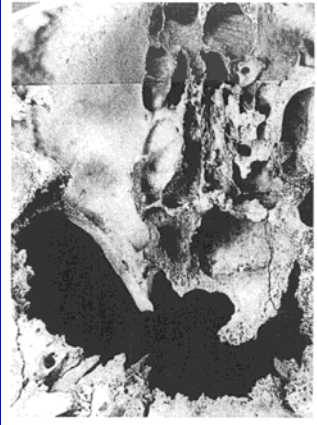


Fig. 1. skull of 40-50 year old man (Strouhal, 1997) and Fig 2 of 35-45 year old female from Naga el-Deir (Strouhal, 1976).

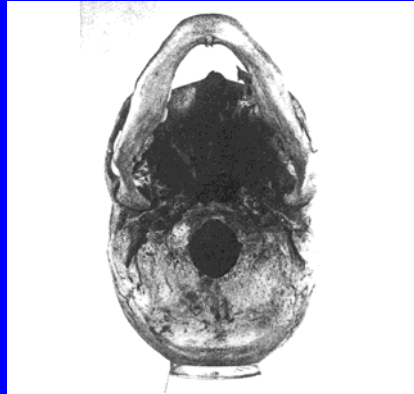


Fig. 2. Destroyed face and base of the skull in a case of a probable nasopharyngeal carcinoma. 35–45-year-old female. Naga el-Deir, Upper Egypt. Photographed by E. Prince. Courtesy of the Lowie Museum of Anthropology, California University, Berkeley, California, U.S.A.

## The case for nasopharyngeal carcinoma (NPC)

- The Epstein-Barr Virus (EBV) is present in the NPC cells.
- NPC affects many young people in developing countries today, the EBV being acquired in childhood.
- The consumption of salt fish especially by young children
- Constant exposure to smoke from household fires in confined spaces.



## Burkitt's Lymphoma



Fig. 5.104 Burkitt lymphoma presenting as a large tumour of the jaw in an African child.

- Although no tumours in ancient Egyptian remains have been positively identified as Burkitt's Lymphoma, it seems probable that the EBV virus and mosquitoes posed a serious risk.

## The case for Burkitt's lymphoma

- Burkitt's lymphoma is commonly associated with the Epstein-Barr virus (EBV).
- It is common in Africa
- It is frequent in regions with endemic malaria.
- There is evidence from Herodotus and from the find of a mosquito-net framework over the bed of Queen Hetepheres, mother of King Cheops (4<sup>th</sup> Dynasty) that mosquitoes were common in ancient Egypt.

## Sites where *Schistosoma* parasites might be passed on from snails.



Fig. 5.83 A canal in a poor housing district in Egypt. Such canals may provide a habitat for the snails which are host to *Schistosoma* parasites. Chronic infection with *Schistosoma haematobium* causes cystitis and often bladder cancer.



Fig. 5.83 from Stewart BW, Kleihues P (Eds.) *World Cancer Report*. WHO/IARC: Lyon, 2003

## Evidence of *Schistosoma* infection in ancient Egypt.



Fig. 1 from Ebeid NI. *Egyptian Medicine in the Days of the Pharaohs*. 1999, shows the symbol for urinary bilharziasis. Fig.2 from Hart GD *et al. Can Med. Ass J* 1977 shows calcified *Schistosoma* eggs in the liver of Nakht, A male teenager from the XXth Dynasty (c1200BC)

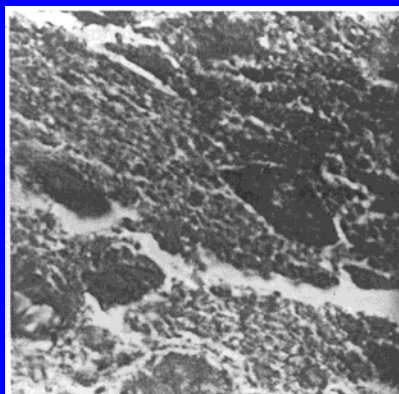


FIG. 1—Calcified *Schistosoma* ova in liver of Nakht (ROM I) (hematoxylin-eosin, x1000).

## The case for bladder cancer

- Strongly associated with *Schistosoma (Bilharzia)* infection.
- There is much evidence in stelae and papyri of *Schistosoma* infection and the haematuria it caused.
- Many young people are infected early in life due to wading in irrigation ditches and other water containing the parasite.
- Bladder cancer is still very common in Egypt for the same reasons.

## Liver cancer

Bread and beer, both made from grain, were staple items in the ancient Egyptian diet.



## The case for liver cancer

- In Africa, hepatocellular carcinoma is caused by Hepatitis B virus (HBV) infection.
- Exposure to aflatoxins produced by *Aspergillus flavus* in stored grain increases the risk.
- Grain was stored in granaries immediately after harvest in ancient Egypt
- Staple foods were grain-based products, bread and beer.
- Age specific rates peak at a lower age in Africa.
- Liver cancer is still very frequent in Egypt.

## The case for colo-rectal tumours

- Colo-rectal tumours might have been rare due to the diet all except the rich Egyptians.
- *Schistosoma* infection is a possible cause.
- The ancient Egyptian diet, high in vegetables and low in red meats, would probably be protective.
- colo-rectal cancers are more frequent in westernised countries for reasons of diet.

## Tumours of bone and cartilage



- This large tumour of the pelvis from the Roman Period (c250AD) from the catacombs of Kom el Shougafa, Alexandria, was tentatively identified by Ruffer and Willmore as osteosarcoma. Later, by Rowling, Brothwell and others as a chondroma or chondrosarcoma.



## Tumours of bone and cartilage



FIG. 1.—Frontal view of skull and growth.

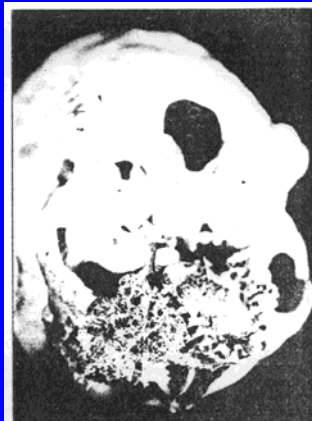


FIG. 2.—View of base of skull.

Salama and Hilmy identified this tumour in a 30 year old man from 26<sup>th</sup> Dynasty from the Pyramids District of Giza as an osteogenic sarcoma, but Ghalioghui suggested it could have other explanations.





## Tumours of bone and cartilage

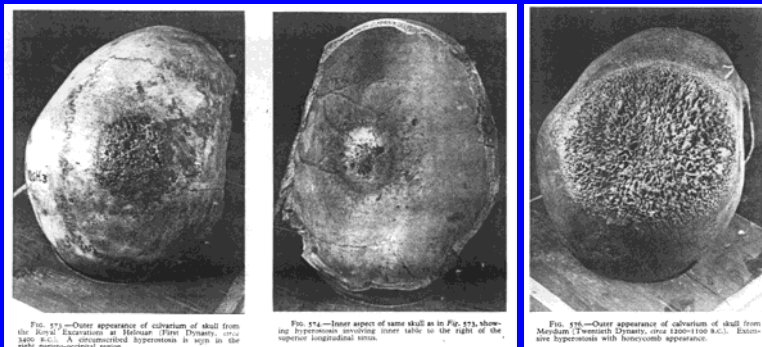


FIG. 173.—Outer appearance of calvarium of skull from the First Dynasty at Helouan (First Dynasty, circa 3400 B.C.). A circumscribed hyperostosis is seen in the right parieto-occipital region.

FIG. 174.—Inner aspect of same skull as in Fig. 173, showing hyperostosis involving inner table to the right of the superior longitudinal sinus.

FIG. 175.—Outer appearance of calvarium of skull from Meridum (Twentieth Dynasty, circa 1200-1100 B.C.). Extensive hyperostosis with hirsutocornu appearance.

These two skulls, one from the First Dynasty found at Helouan (c3400BC) and the other from the 20<sup>th</sup> Dynasty at Meydum (1200-1100BC) were diagnosed as meningioma by Hussein (B de L'Inst d'Egypt, 1049/50 and this was confirmed by radiology (Rogers *B.J.Surgery*, 1949)

## Tumours of bone and cartilage



Large part of the rear of the skull base destroyed by a long-term tumour whose projections caused smaller perforations in other regions of the skull

Strouhal *Egyptian Arch.* (1995) described this huge tumour removed from the skull of an old man. It might have been benign or possibly a carcinoma from the scalp or a sweat gland or even a metastasis from a cancer of an internal organ.

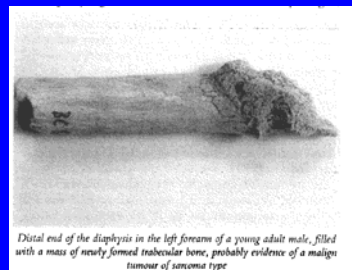
## Tumours of bone and cartilage



Large cavity in the right femur of an elderly man. This is a case of a bone cyst, a type of benign tumour

This tumour, in an elderly Man, found in the tomb of Maya and Meryt, Sakkara, was identified by Gray and Strouhal as a large bone cyst.

The remains of a sarcoma in the left forearm of a young adult male, also from Maya and Meryt was identified by Strouhal and also by Gray.



Distal end of the diaphysis in the left forearm of a young adult male, filled with a mass of newly formed trabecular bone, probably evidence of a malignant tumour of sarcoma type

## Tumours of bone and cartilage

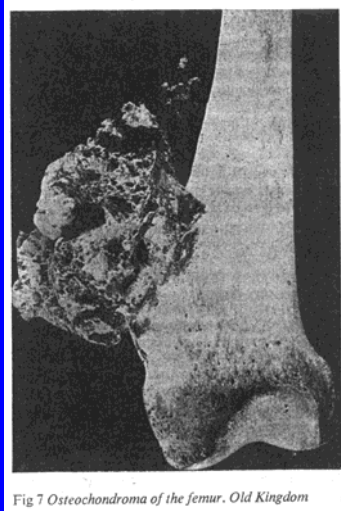


Fig 7 Osteochondroma of the femur. Old Kingdom

This tumour in a femur from the Old Kingdom seems to have been fairly definitely identified by Rowling, whose photograph this is, and by Brothwell as an osteochondroma. Smith and Dawson incorrectly identified a case of osteosarcoma and two of sarcoma in skeletons from the 5<sup>th</sup> Dynasty at the Giza pyramids. Sandison later concluded they were osteochondromatous as so many other lesions have proven to be.

## The case for tumours of bone and cartilage

- The age-specific curve for osteosarcoma peaks in adolescence and again in old age.
- The adolescent peak is associated with the pattern of childhood skeletal growth.
- Endogenous hormones, pituitary growth hormone, thyroid hormone, androgens and oestrogens, appear to be involved.
- Johnson (1953) proposed the excess-growth hypothesis, namely that the incidence of osteosarcoma is a function of the cellular activity in bones.
- In adolescents the main sites for osteosarcoma are at the epiphyses of long bones, the points of maximum growth.

## Basal cell naevus syndrome

Two skeletons from Asynt showed evidence of this rare genetic disorder: basal cell carcinoma (Gorlin and Goltz (NEJM,1960), bifid ribs, short metatarsals, cysts in mandible (Satinoff and Wells (Med H 1969).

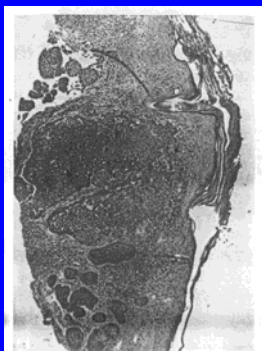
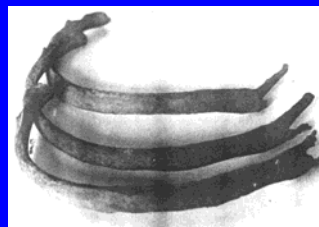


FIGURE 1. Basal-Cell Carcinoma Removed from the Side of the Nose in Case 1 (1959).

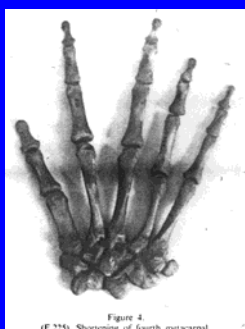


Figure 4.  
(E.225). Shortening of fourth metacarpal.

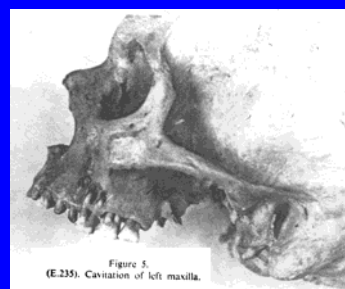


Figure 5.  
(E.235). Cavitation of left maxilla.

## Tumours of the female reproductive system



## Tumours of the female reproductive system



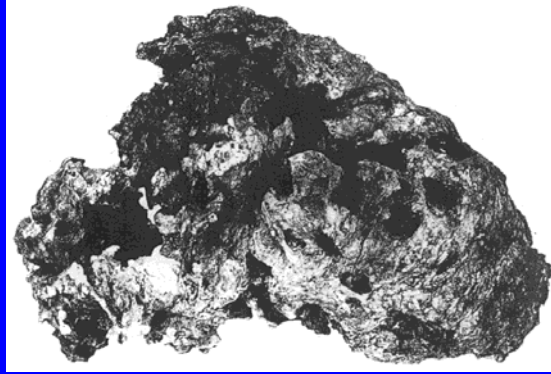
In 1825, who Granville examined and described the mummy of Irty er Senu, considered the lesion in the ovary to be a cystadenoma that had caused her death. Tapp has now found it to be benign

## Tumours of the female reproductive system



Reproductive organs of Irty er Senu, now in the British Museum as dissected by Granville in 1825.

## Tumours of the female reproductive system



A calcified myoma of the uterus, in a 35-45-year-old woman from the 3<sup>rd</sup>-5<sup>th</sup> century AD in Sayala, Nubia.

From: Strouhal E. *Life of the Ancient Egyptians*. London: Opus, 1997. P. 249.

## The case for cancers of the female reproductive system

- Cancers of the uterine cervix would be likely to be common in ancient Egypt.
- Girls married at the age of 12 years, or thereabouts, cervical cancer is strongly associated with early initiation of sexual activity.
- Partners who have multiple partners.
- Number of pregnancies.
- Human papilloma virus.
- Other tumours of the female reproductive system might have been relatively rare.

## Tumours of the breast



266 Two metastatic lesions on the top of the skull of a 35-45-year old woman most probably caused by carcinoma of the breast. Christian cemetery at Sayala in Egyptian Nubia. 6th-11th century AD. Vienna, Naturhistorisches Museum

This skull of a 35-45-year-old woman from a Christian cemetery At Sayala Nubia from 6<sup>th</sup> –11<sup>th</sup> Centuries AD shows two lesions which Strouhal and others consider to be likely metastases from carcinoma of the breast.

From: Strouhal E. *Life of the Ancient Egyptians*. London: Opus Publishing, 1997.

## The case against tumours of the breast

- Breast cancer would be likely to be relatively rare in ancient Egypt.
- Risk is increased by westernised lifestyle, e.g. a diet high in saturated animal fat and low in fruit and vegetables, obesity and lack of exercise.
- Late or no pregnancies.
- That which did occur would be most likely to be familial breast cancer which affects younger women.

## Tumours of the lungs?



Lungs of Irty er Senu in the British Museum, showing glistening, granular texture.

## Tumours of the lungs?



Constant exposure to household Smoke in enclosed spaces.

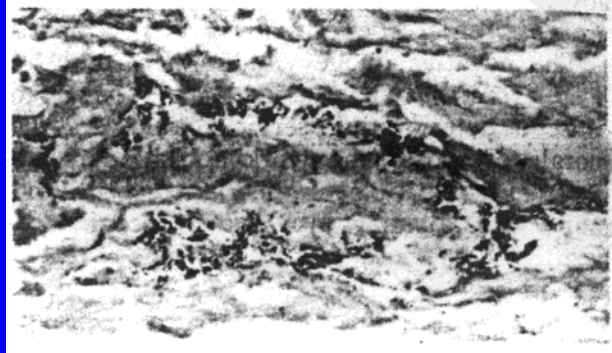


Sand



Granite dust

## Tumours of the lungs?



Sand pneumoconiosis in an Egyptian mummy. Tapp E *et al.*  
*BMJ* 1975.

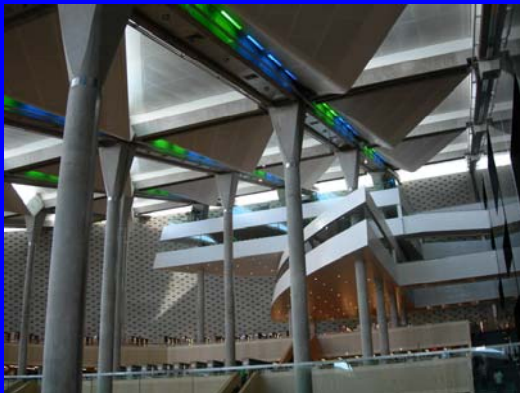
## The case for tumours of the lungs

- Constant inhalation of household smoke in enclosed spaces.
- Constant inhalation of sand and granite particles,
- Frequent cases of anthracosis and pneumoconiosis.

## Tumours of the lungs?



## Conclusion



As new techniques for studying ancient Egyptian mummies are developed, they will enable much more to be learned about the tumours of that period, especially if expectation of life, environment and lifestyle are considered in conjunction with the physical evidence.