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Gummatous Destruction of The Nose, Osteitis, and Permanent Dislocation of The Jaw In a Laboratory Cadaver*

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Introduction

The cadavera used in the Anatomical Laboratory of Howard University are subjected to a routine documentation which greatly enhances their scientific value and often results in the detection and preservation of anomalous or pathological structures which would otherwise escape attention. For each cadaver our files contain a full length photograph, personal data transcribed from the death certificate (name, age, sex, race, cause and date of death, birthplace, occupation, length of residence in D. C.), clinical history from hospital records when available, some seventy anthropometric measurements, drawings of vascular patterns, drawings or photographs of anomalies, and a detailed estimate of skeletal age and morphology. These records and the complete skeletons are on permanent file available to all qualified investigators.

The case here reported is in some respects a problem in diagnosis but it presents a combination of unusual features which we feel will be of general interest.

History

The scant records obtained after prolonged search show that the subject (H. U. No. 22), a female American Negro of about 65 years,† visited the Gallinger Municipal Hospital in December, 1922, for treatment of an obscure complaint (pain in the left side). At that time there were noted: a "large amount of scar tissue and areas of leucoplasic scars" on the face; complete loss of the nose, the nares being represented by two small openings; and restricted movement of the jaws. The patient stated that seventeen years previously (1905), she had been caught in a blizzard and suffered frost-bite of the nose and face. Subsequently the nose was lost. The Wassermann reaction in 1922 was recorded as, "Cholesterinized antigen—Partial positive, Plain Alcoholic antigen—Negative." A tentative diagnosis of "Syphilis" was made. The subject died October 23, 1930, and her remains were later received at the Anatomical Laboratory. Necropsy was not performed. The certified cause of death was "Arteriosclerosis, contributory-Rheumatism."

Physical Findings

Fig. 1 shows, though not clearly,‡ that the cartilaginous portion of the subject's nose had been completely destroyed and that in its place was a large somewhat triangular and fairly symmetrical scar which spread upward over the root of the nose, downward to the mucous membrane of the upper lip, and slightly beyond the corners of the mouth on either side.

After the routine bisection of the skull for removal of the brain it was found that the septum of the nose,

both bony and cartilaginous, and the lateral walls of the nasal chamber had been completely destroyed. In addition the adjacent walls of the entire group of ethmoidal cells had on both sides been partially or totally resorbed. The very small sphenoidal sinuses were transformed into a single recess of the nasal cavity. The frontal sinuses were represented by a single much reduced cavity directly continuous with the nasal chamber through an opening 6 mm in diameter. The narial apertures, therefore, opened into a single large cavity comprising the nasal chambers, the maxillary antra and the ethmoidal, sphenoidal and frontal sinuses. The sinuses thus appear secondarily in their primitive morphological relationships as diverticula of the upper end of the respiratory passages. The whole of the composite cavity was covered with apparently normal mucous membrane. There was no evidence of recent activity of any pathological process.

After maceration the bony margins of the nasal aperture were observed to be much rounded and slightly thickened in contrast to the normal sharp margins. Only about 1 mm of the distal ends of the nasal bones had been resorbed. A secondary deposit of smooth

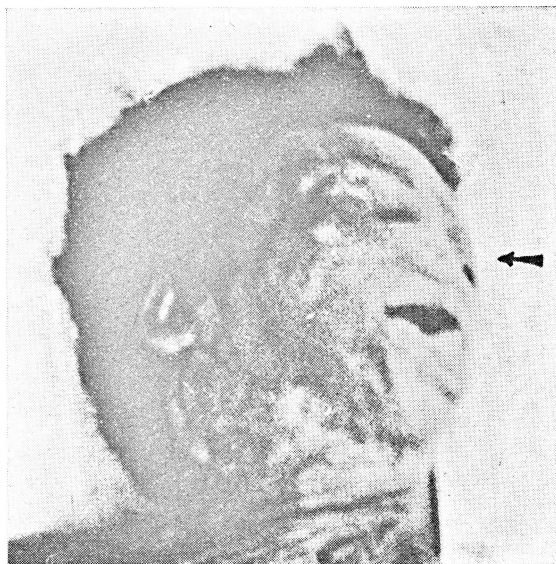


FIG. 1. THE FACE BEFORE DISSECTION (H. U. No. 22) Showing absence of cartilaginous portion of external nose, narial apertures (indicated by arrow), scar on site of nose, and protrusion of lower jaw

bone had thickened the left nasal bone to about three times normal depth. This secondary osseous deposit was continuous but of varying thickness throughout the enlarged nasal chamber. It has obliterated about a third of the space of the left maxillary antrum. There were indications, though a definite statement cannot be made that the recesses representing the frontal and sphenoidal sinuses have also been reduced in size by this secondary deposit of bone.

The attachment of the nasal septum is a low, rounded ridge on the nasal floor. The floor itself is normal.

The nasal cavity communicates with the orbit through a foramen, intact only on the right, 7.5 mm in diameter, which is an expansion of the nasolacrimal canal. The orbital walls are complete.

The series of features just described is clearly displayed in the photograph of the macerated skull, Fig. 2.

The jaws are nearly edentulous and typically senile. The angle of the ramus and body of the mandible, shows the widening frequent in age. Chronic forward dislocation of the mandible has resulted in the formation of permanent secondary articular surfaces (Fig. 3). These

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†Age on death certificate 57 years; age calculated from hospital record, 61 years; skeletal age, ca. 70 years; true age ca. 65 years.

‡Cut made from enlargement of a snapshot; the poor quality of the photograph is regretted.

Copy to H. M. Cobb, 1935

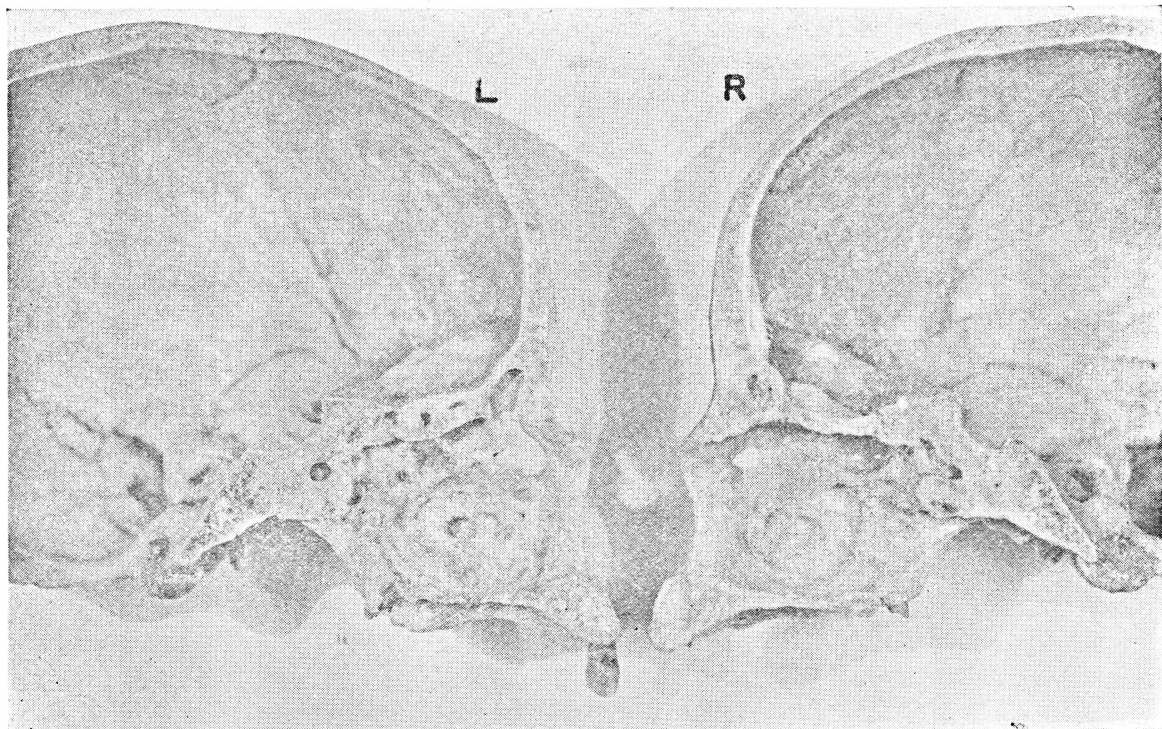


FIG. 2. DESTRUCTION OF INTERNAL NASAL WALLS

Bisected skull showing composite cavity comprising nasal chambers, maxillary antra, ethmoidal cells and frontal and sphenoidal sinuses. Left antrum partially obliterated by secondary deposit of bone

are situated on slightly cylindrical bony buttresses which have grown out from the preglenoid portion of the temporal bones. The articular surfaces themselves and the opposing condylar surfaces are irregular and eroded due to arthritis, but unusually complementary as would be expected because of the loss of the inter-articular disk. The forward displacement of the mandible is such that the left canine, the only tooth remaining in the upper jaw lies opposite the interval between the lower premolars and 2 mm internal to their lingual surfaces. The functional temporo-mandibular joint could not have been efficient, but reduction would have been impossible because of the altered condylar surfaces. The glenoid fossae are normal.

In Fig. 5 are shown additional osseous abnormalities. The right femur is 21 mm shorter than the left. The tibiae are of equal length. The right femur exhibits also a fusiform enlargement involving the entire shaft from the region of the trochanters to the junction of the third and lower fourths of the bone. Roentgenographic examination reveals considerable cortical thickening of the bone, endosteal as well as periosteal. The trabeculae of the head of the right femur are much heavier than those of the left. This is undoubtedly due to the greater weight-bearing strain on the shorter right femur.

Several osteophytes are present in different regions. On the left femur an exostosis projects medially from the linea aspera. Its anterior surface, smooth and concave, was adjacent to the vastus medialis but afforded the muscle no intimate attachment. The posterior surface and the edges of the prominence are rough for the attachment of the adductor tendons in which it was formed.

The left obturator foramen is spanned by an ossific process in the obturator externus which extends from the inferior pubic ramus to within 2 mm of the lower margin of the acetabular notch. It is directed toward the insertion of the muscle on the femur.

The right scapula presents a bony spicule extending from the medial side of a poorly marked scapular notch to a point 9 mm behind the root of the coracoid process.

This osteophyte lay within the supraspinatus and is not an ossified transverse ligament.

Healed fractures of two right upper ribs show excessive callous formation. Bony union of the left fifth, sixth and seventh ribs near their cartilages, however, gives no appearance of stimulation by fracture. The right fibula exhibits a long healed impacted fracture of the head.

Lipping of the articular margins of the long bones is conspicuously absent. There is no spondylitis or fusion of vertebrae. The texture of the entire skeleton is distinctly senile.

Discussion

Conditions were found in the cadaver which might suggest all four of the disease processes mentioned in the clinical history—gangrene of the nose from frost-bite, lues, arteriosclerosis, and rheumatism. The evidence for each must now be appraised and other possibilities considered.

The Nose: The subject's statement that the loss of her nose was due to frost-bite is probably a fiction. The scar was too extensive and the internal destruction too deep and widespread to make this plausible. Search of the literature did not yield any cases of frost-bite gangrene which presented destruction of a character corresponding to the present case. A diagnosis of healed gumma seems best to fit the facts.

My recorded impression on first viewing the scar was that it was the result of a burn. That the scars of healed gummata may be grossly indistinguishable from those of burns is well

known. Infections, tuberculous or mixed, or parasitic invasions tend to leave a more rarefied bone than was found in this case. It can be observed in Fig. 2 that the superficial bony deposit lining the composite nasal cavity is hard and sclerosed. Vascularity has disappeared. Such bony deposits may appear as a reaction to low grade inflammation but the latter could not account for the amount of destruction shown in Fig. 2. Neoplasm is improbable because of the nature of the scar and the complete healing which has resulted. The nose was lost twenty-five years prior to death according to the subject's statement and the Gallinger Hospital record shows that the lesion was healed at least eight years before death.

The bony destruction in the nasal cavity conforms closely to that described for gumma of the nose by Knaggs.¹ The fact that the

The Femur: Despite the extensive clinical literature on osseous syphilis sufficient conclusive diagnostic criteria have not yet been developed. This is especially true concerning appearances in the naked bones themselves.

Although the ossific enlargement on the right femur presents the typical features commonly associated with luetic osteitis, the diagnosis is not assured. Chronic sclerosing osteitis may easily be mistaken for the syphilitic form. The former condition, which also is held to be an infectious process often following diseases such as pneumonia, influenza and typhoid fever, exhibits like lues, "an increase in the diameter of the bone in a circumscribed area, a thickening and eburnation of the cortex and a distinct narrowing of the medullary cavity . . . which may become completely obliterated."² The chronic sclerosing enlargement is said to be more regularly fusiform

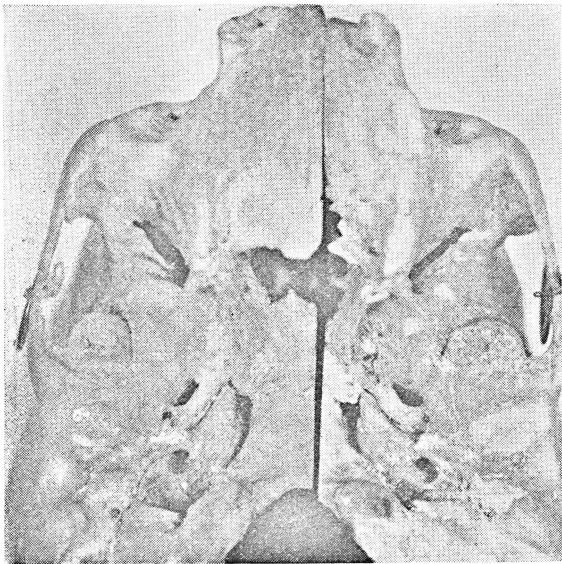


FIG. 3. SECONDARY ARTICULAR SURFACES FOR MANDIBLE
Permanent dislocation has resulted in development of bony buttresses upon pregenoid portion of temporal bones

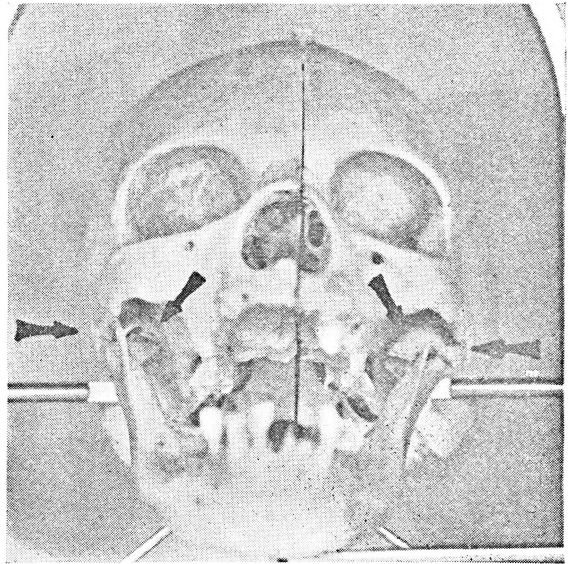


FIG. 4. TEMPORO-MANDIBULAR ARTICULATION
Skull mounted on craniostat showing secondary buttresses and arthritic joint surfaces; also destruction of inner walls of nasal cavity

nasal bones themselves were not markedly attacked in our subject has no diagnostic significance.

In addition, the bony destruction in our case closely resembles that in a syphilitic skull in the Museum of the Royal College of Surgeons, shown in an excellent photograph by Knaggs (Fig. 39), and also the destruction in a skull in the Hamann Museum, believed to be luetic, described by Professor T. Wingate Todd who had opportunity to examine our specimen.

Thus the nasal pathology, considered on the basis of its own physical features, suggests gumma as its cause more strongly than any other etiologic factor. It is quite possible that the alleged frost-bite may have acted as an exciting agent.

while the luetic tends to be irregular. A close distinction between the two forms of osteitis cannot be made.

There are no indications of Paget's disease, fracture, neoplasm or osteitis-fibrosa cystica in the present specimen. The latter is most probably affected by lues or some other infectious process.

It will be noticed that no attempt has been made to associate the findings in face and thigh with each other or with the "partial positive" Wasserman and tentative diagnosis of syphilis mentioned in the history. Lues could have affected the nose and another infection caused the femoral pathology. The reliability of the hospital diagnosis is certainly questionable though not without value.

Another interesting feature is the fact that

the right femur is nearly an inch shorter than the left. A congenital difference in the femoral lengths cannot be excluded, but it is highly probable that the shortness of the right bone represents an inhibition of shaft growth produced by the inflammatory process. If this be true, the osteitis must have been active during the pre-adult period. The epiphyses are fully formed and completely united.

The Dislocated Jaw: The bony buttresses which have been built up to furnish secondary articular fossae on the preglenoid portion of

at Gallinger Hospital in 1922, eight years before death. Undoubtedly the dislocation had long been permanent at that time. What relationship existed between the nasal pathology and the dislocation cannot be determined.

The Osteophytes: The death certificate listed "Rheumatism" as a contributory cause of death. The joint surfaces themselves showed no gross arthritic changes. It has become recognized, however, that joint involvement is but one manifestation of the incompletely understood rheumatoid syn-

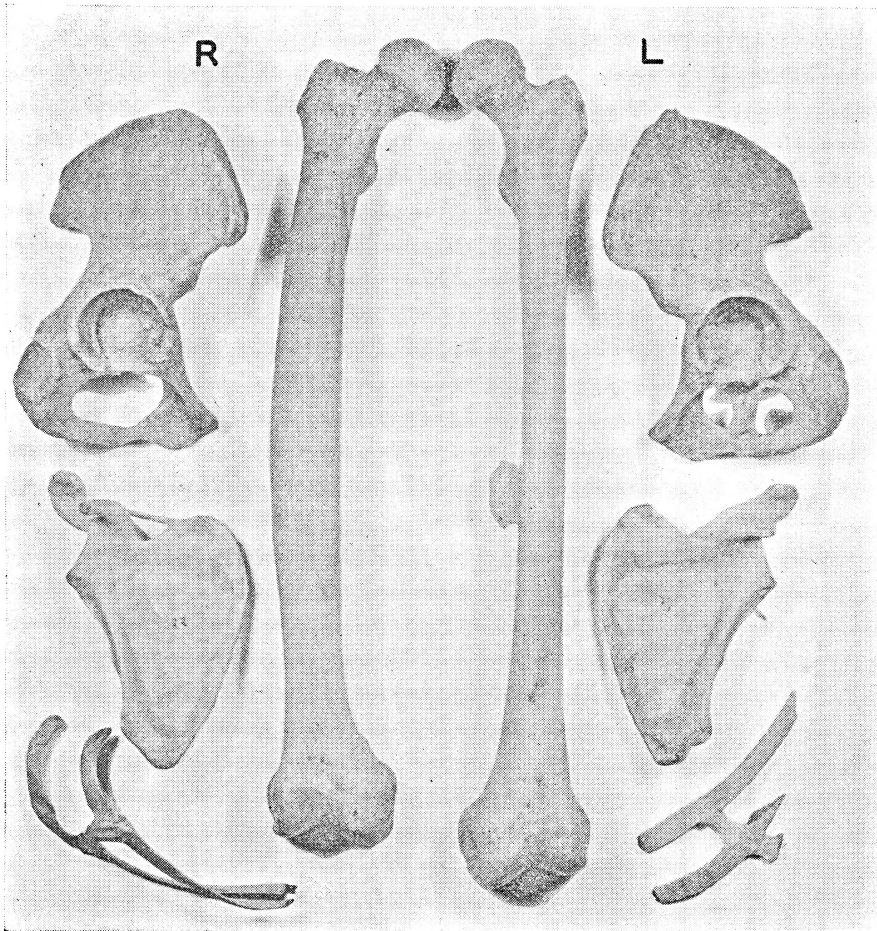


FIG. 5. ADDITIONAL BONY ABNORMALITIES

Right femur with osteitis, 21 mm shorter than left; osteophytes on left innominate, left femur, right scapula; healed fractures right ribs; osteophytes left ribs (fracture?)

the temporal bones are very unusual features. No reports of similar cases were discovered in the literature nor were such cases known to exist in two of the largest skeletal collections in the country, those of the United States National Museum (14,000 skulls) and the Hamann Museum of Western Reserve University (2,500 skulls). The reason for the rarity is most probably that dislocations of the jaw are generally reduced before so definite a response to irritation has time to develop. The arthritic character of the functional joint is a natural consequence of its irritative origin.

Restricted movement of the jaws was noted

drome. Ossific deposits in muscle and tendon are another.³ I do not refer to Myositis ossificans. Secondly such bony deposits may give raise to rheumatic pain. The exostoses shown in Fig. 5 were probably in part at least a basis of whatever rheumatoid symptoms the subject had.

Arteriosclerosis: The records of dissection do not mention the condition of the arteries. It is certain that no calcification was present. However, the thin, atrophic condition of the scapulae, seen often but not necessarily associated with senility, is very suggestive of arteriosclerosis. The atrophy appears to

depend primarily upon altered vascularity leading to irregular bone absorption.⁴

Constitution: The remains of the subject have indubitably established that, whatever the correct diagnoses may be, her body had successfully withstood over several decades the attacks of chronic disease (femur, nose, osteophytes) and trauma (dislocated jaw, fractured ribs). This evidence of constitutional hardihood is of interest when it is noted that the vertebral borders of the scapulae are convex instead of straight or concave. Graves has shown that individuals having convex borders survive to old age in larger numbers than those who have the other types. Since the contour of the vertebral border is fixed by the twelfth fetal week, he has regarded the feature as an index of human fitness.⁵ It is perhaps the best single such criterion now available.

Summary

1. Significant physical features of the face, skull and skeleton of a laboratory cadaver twenty-five years after presumed gummatous destruction of the nose are described and the diagnostic problems discussed.

2. Evidence of constitutional hardihood is indicated.

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