

Johnson (W. B.) *al*

Necrosis of the Maxillae, with a Report of Three Cases.

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SURGEON TO THE PATTERSON EYE AND EAR INFIRMARY, SURGEON
TO THE PATTERSON GENERAL HOSPITAL, ETC.

*Read in the Section of Diseases of Children, at the Forty-second
Annual Meeting of the American Medical Association,
held at Washington, D. C., May 5-8, 1891.*

presented by the author

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NECROSIS OF THE MAXILLÆ, WITH A REPORT OF THREE CASES.

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Necrosis is the death of bone in mass with subsequent separation of the part, being analagous to gangrene of the soft tissues, and differing absolutely in its physiology from caries, which is a molecular death of bone resembling the ulcerative process.

Necrosis occurs with considerable frequency in the maxillary bones, having a decided preference for the inferior maxilla, which it affects in about 65 per cent. of the cases; its selection of the lower jaw as a seat of infection is probably due to the comparatively limited vascularity and the absence of periosteal reduplication in this bone, and to its position being unfavorable to proper drainage.

The causes of necrosis of the maxillæ are ostitis, periostitis or periodontitis resulting from one

or more of the conditions or diseases here enumerated.

By extension.	{	Dental ulceration.
	{	Alveolar inflammation.
	{	Alveo-dental inflammation.
By irritation.	{	First or second dentition.
	{	Eruption of wisdom teeth.
By disease	{	Syphilis.
	{	Exanthema.
	{	Scrofula.
	{	Mercurials, systemic.
By poisons.	{	Phosphorus, local.
	{	Arsenic, local.
	{	Chloride of zinc, local.
By traumatism.	{	Teeth extraction.
	{	Blows or falls.
By idiopathia.		

In maxillary necrosis from any cause the infection and the course of the disease are very similar, varying only in the location of origin and in the extent of the destructive action.

The inflammation may occur primarily in the osseous structure itself causing an excessive engorgement with rapidly increasing stasis in the blood vessels, resulting, if not speedily relieved, by antiphlogistic local and constitutional treatment, in a complete cessation of the nutrient faculty with immediate death of the entire portion of bone affected, and subsequent separation from its periosteum and exit through the soft parts.

This inflammation of the osseous body itself occurs more frequently as a result of the process of dentition. When occurring from this cause the effect is more prolonged, in consequence of the continued irritability and excitability of the parts concomitant to this process.

If the inflammation originates in the periosteum or periodontium, the resulting necrosis is apt to be less rapid or extensive, and occurs from the separation of the periosteum or periodontium from the osseous structure by a plastic hypertrophic exudation of osteophytes causing death of the bone from malnutrition, and accounts for the wonderfully perfect reproduction that is happily of so frequent occurrence after this disease. The periosteum is frequently destroyed in part during the progress of the disease, as also are the deciduous teeth and the permanent teeth germs, although disease may completely encircle a permanent tooth in its alveolar crypt without passing through its vascular sac or in any way affecting its formative tissue or interfering with the process of calcification, in which case the tooth may go on to a stage of complete development and be erupted, in the newly formed osseous tissue, at its natural point or at some point along the jaw which may have been designed for a tooth which was destroyed by the disease. The necrotic process is marked by four distinct periods.

1. The hyperæmic or stage of inflammatory engorgement.
2. The hypertrophic or stage of cacoplastic exudate, with formation of fetid pus.
3. The separative or stage of demarcation of bone with loosening and exfoliation of teeth.
4. The formative or stage of exit and reproduction.

The treatment should always be applied in

strict accordance with the existing stage of the disease.

1. Active antiphlogistic internal medication and external application, blood letting, prompt removal of any exciting cause or source of local irritation.

2. Early incision, antiseptic syringing, assistance in commencing separation of periosteum.

3. Antisepsis, constant syringing, tonics, removal of bone through the mouth in pieces or in mass without injury to the periosteal cradle, when exfoliation has occurred and it can be completely and readily separated from the periosteum and soft parts. To remove the body of the lower jaw, division at the symphysis is imperative.

4. Antiseptics, cleanliness, stimulating injections, continued tonic treatment and nourishment, while the discharge persists. Nature does the rest.

The prognosis is good as regards the question of ultimate recovery, although in patients of a scrofulous or syphilitic habit and in poor tissue builders the progress of the disease is slow, (from seven months to two years) and the destruction of tissue is often so extensive that a greater or less amount of permanent deformity results.

The usefulness, strength and natural motion of the jaw is generally maintained either by the formation of new bone if the periosteum is healthy, or in case material destruction of the periosteum has occurred, by the formation of a fibroid cicatri-

cial tissue of unusual strength supplying its place.

Case 1.—W. B., age 4, United States. Male. His family history is good on the paternal and maternal side; no history of disease of bone can be traced. For a little over a year before coming under observation he had trouble on the right side of his face. He had at first a swelling over the superior maxillary bone which assumed a bluish color, was attended by severe pain and a decided febrile movement coming on suddenly, and under hot paluvia and general antiphlogistic treatment almost entirely disappearing, only to reappear in the course of a few days or weeks.

Three months after the onset of the disease an external incision was made just under the lower eyelid and a considerable quantity of pus was discharged; the fistula thus formed continued to discharge up to the time of his first visit.

On examination found some tumefaction of the cheek and a permanent spot of ulceration just under the eyelid about over the orbital ridge, causing a marked ectropion as a result of cicatrization and adhesion, passing a probe through this opening, dead bone was instantly discovered about the infra-orbital edge of the superior maxillary bone, extending downward towards the teeth and backwards towards the orbital plate of this bone.

An operation was advised and performed as follows: the patient being etherized, an incision was made in the mouth extending from the first

bicuspid tooth backwards one inch and upwards towards the fistulous opening about three quarters of an inch; a probe threaded with a seton of braided horse hair several strands thick was then passed into the incision and through the fistulous opening. This seton was fastened securely in position; one end passing from the mouth and the other from the opening, being retained for one week; after this time it was removed, the internal opening became permanent and the external closed in a few weeks.

The opening within the mouth was increased in size by the manipulation used in separating the periosteum from the bone and in removing plaques of bone from time to time until all of the external alveolar plates of that side had come away.

About three months after the first examination, and fifteen months after the onset of the disease, a smooth prominence was detected by the probe high up and apparently just under the orbit. It was removed with difficulty; although not firmly fixed, it had the size and shape of the crown and body of a second molar permanent tooth. It was devoid of roots and seemed to be in process of formation. It was very light and semi-transparent, having a very sharp edge, and within this edge and adherent to the tooth was a small mass of formative pulp; a large piece of dead bone which formed the external wall of the antrum of Highmore, was also removed at this time causing a profuse hæmorrhage, some of which was discharged through the nose;

hæmorrhage from the nose occurred quite frequently during the progress of the treatment, subsequent to this time, as a result of passing the probe in search of dead bone. Inflammatory attacks had occurred on different occasions up to this last procedure and had been accompanied by profuse discharge of pus from the internal opening and on several occasions from the external opening also, but from that time on no more bone was removed and the sinuses were allowed to heal.

Eight years later, at the present time, the patient is strong and well nourished, has had good health and no trouble with his teeth, has a depression along the entire right side of the upper jaw due to loss of the alveolar plates. The lateral, eye, first bicuspid, and first molar permanent teeth are perfect and in good position, the second bicuspid is in position but entirely reversed, so that the external and internal surfaces of the tooth look from before backward. The second molar is absent. The cheek is adherent to the maxilla held by several cicatricial bands at the point of opening of the old internal sinuses. There is a slight scar under the eye and an almost imperceptible drooping of the lower lid, the cicatrices which caused the ectropion having been absorbed. The patient's present appearance would hardly suggest the possibility of so tedious and extensive a disease ever having existed.

D. M., a female, age 5, United States. Her family on the father's side has been noted for

longevity and strength and give no history of any infectious or hereditary disease. The mother is of an extremely nervous and excitable temperament, and on her side relates a history of pulmonary trouble, but not within her immediate family. There has been no history of bone disease on either side. The patient had always been healthy and was fat and robust, never having had any illness of importance until the onset of the present trouble, nine months previous to her coming under observation. When four years and three months old a swelling of the left side appeared and was accompanied by occasional attacks of pain. This swelling and pain was considered a result of ordinary toothache and was very much neglected.

Three months from the time of its inception, the tumefaction and pain having persisted and increased, an opening occurred on the inner side of the cheek near the angle of the lower jaw, through which considerable quantities of stringy pus was discharged. The opening and discharge had occurred after great febrile disturbance, swelling and pain; from this time until nine months after the disease first appeared, the history is a simple repetition of exacerbation of the swelling and return of a subsiding discharge through openings permanently established or through new openings occurring, and always being accompanied by febrile disturbance and pain.

First examined patient nine months after the onset of the disease. At that time there was

great tumefaction of the face on the left side with external and internal points of opening or cicatrization.

The swelling was extremely hard and unyielding to pressure at any point, extending over the entire left side of the face and neck, and was not painful except when an attack of inflammation was coming on and pus was forming.

The child was unmanageable, and ether was administered in order that a proper examination could be made; on the outer side of the lower jaw at and in front of its angle several fistulous openings were discovered, into which a probe was passed disclosing some points of roughened bone. There were several external openings which communicated directly with the roughened bone itself, or opened into other sinuses within the mouth.

Two weeks after the above described examination, which resulted in a decided increase in the softening, redness and swelling of the parts, and an attack of cervical adenitis, she was advised to submit to an effort at removal of the dead bone, which was detected at the first examination. She was placed under ether and an incision about an inch in length was made extending from the angle of the jaw forward. Large quantities of fetid pus and a plate of bone the size of a five cent piece were removed. This opening was made permanent by syringing, manipulation and applications, and during the three months following, there were removed, from eight to

twelve small plates of bone, varying in size from a split pea to the little finger nail, and, also, two of the permanent teeth in process of formation; one had attached to it the formative pulp and was apparently healthy, the other had arrived at the stage of crown formation, was greenish and discolored and had the appearance of having been the original cause of the trouble and having probably acted as a foreign body for months.

The disease, after this operation, practically abated, although it was some weeks before the sinuses all closed, and the treatment was continued until that time.

Present appearance, eight years after the cessation of the trouble, patient strong and well nourished, has five scars about the angle of the jaw on the cheek, and a decided sinking and loss of tissue at the angle of the jaw and extending forward to the bicuspid teeth. The two molar teeth are gone, having been lost during the progress of the disease. The second bicuspid tooth came in, but decayed very shortly after and its removal was rendered necessary as it was also ulcerated; it had, however, ample root formation. The mucous membrane of the cheek is drawn towards the opening made at the operation by cicatricial bands, adherent to the reproduced portion of the jaw bone, which has changed its shape slightly at the angle in consequence of there being no teeth to oppose the upper molars.

The patient is rather a prepossessing child and is but slightly deformed as a result of her necrosis.

H. D., male, age 6, United States. Has a syphilitic history on the paternal side, which disease, as far as can be ascertained, was never contracted by the mother. Has no family history of diseased bone. Was in the enjoyment of excellent health, and had suffered from none of the diseases of childhood; at five years of age he had a moderate swelling of the face and toothache, so-called. The pain in the face and swelling increased to such an extent that in three days the parents were compelled to consult a dentist, who extracted the tooth supposed to be the cause of the trouble; the tooth drawn was only slightly decayed.

The drawing of the tooth was immediately followed by so rapid an increase in the swelling that on the second day thereafter the patient was unable to open his mouth.

Two months after this time, the child meanwhile having been very ill and suffering great constitutional depression, an operation for the removal of dead bone was performed, and five small scales varying in size were removed; all of these scales were very thin and rather longer than they were broad.

First saw patient one year and two months after the onset of the disease; there were several internal and external scars and openings where previous incisions had been made. The face was swollen and hard, but the inflammation was not and had not been very severe for a few weeks, the discharge of fetid pus was very great, an abun-

dance of dead and roughened bone could be readily detected, and it was easily movable when traction was made upon it with a bent probe.

Immediate operation was advised, the patient was etherized and a long incision made extending from the angle of the jaw nearly to the median line; the left half of the inferior maxillary bone was removed in two large pieces; a number of spiculæ of bone of different sizes also came away during the operation. The largest piece represented the body of the jaw and had connected with it two teeth not completely formed, slightly discolored, dead and not in process of formation, as there was no pulp adherent to them. The other piece consisted of the angle of the jaw, the condyle and coronoid process, and required for its removal sharp traction on the dental forceps, although it was undoubtedly separated from its periosteal cradle. After the removal of the bone mentioned the parts were thoroughly cleansed until no particle of dead bone could be felt at any point.

The child passed from my care after the operation but never had any subsequent attacks of inflammation and no dead bone was discharged or removed after that time, although the purulent discharge continued in decreasing amount for nearly a year. The long continuance of the discharge after all dead bone had certainly been entirely removed, is ascribed to the fact that proper antiseptic treatment was not continued, the parents being unable to persuade the child to under-

go any further manipulation or application after the operation.

I have with difficulty been able to induce him to present himself for inspection at this time, over seven years after the trouble has passed away.

He is 13 years old, male. His general health is good, and has been so since the discharge stopped six years ago. During this time two teeth were erupted in addition to those at present in the jaw; one was on correct line but was partly decayed, the other was out of line and grew towards the cheek; the removal of this tooth was not painful but the line tooth was more firmly fixed and caused some pain on its removal. While these teeth remained in position they were a source of irritation, and also had a slight but constant purulent discharge from around their roots; after these teeth were removed, there was a great decrease in the tumefaction of the side of the face.

Inspection discloses a large scar on the neck, the result of a cervical adenitis which had occurred in the early stages of the disease. The angle of the jaw is depressed and the side of the face is very much sunken at that point and in front of it nearly up to the median line. The lower jaw as reproduced is much shorter from before backwards than it was formerly, the central teeth striking about three-quarters of an inch behind the natural line, as shown by the position of the teeth of the upper jaw.

He has one bicuspid and an eye tooth on the diseased side, and also the central and lateral, which are in correct position; the eye tooth is misplaced, growing forward with most of its root exposed, and is partially decayed, and should be drawn. The bicuspid is in line and in position and seems to be a perfect tooth.

The jaw bone has made a complete reproduction, but is composed on the diseased side of a comparatively small amount of osseous tissue; it is very useful, and strong enough for any of its ordinary uses.

The resulting deformity is much greater in this case than in either of the others, the sinking of the cheek and shortening of the maxilla giving the features a peculiar cast.

The study of the cases here reported and the history of other cases considered, indicate that incision and appropriate treatment in the early stages of the disease have a decided tendency to lessen its extent, while early efforts at removal of dead bone before separation has occurred, are apt to increase the extent of the disease and resulting deformity, and may lead to a fatal termination.

