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## Maxillo-Facial Cellulitis

By THOMAS W. EDWARDS, D.D.S.

Chi Lambda Kappa, '38

IT IS IMPORTANT that the general practitioner of dentistry be acquainted with Maxillo-facial Cellulitis, in spite of the fact that the majority of such cases are treated by the oral surgeon, and sometimes by the general surgeon. We should appreciate the fact that most of these cases are of dental origin and the general practitioner is often in a position to prevent their occurrence. How may we prevent it? Primarily by advising patients to have those teeth removed that are badly carious and have lost their usefulness, and by judicious management of acute infections of the oral cavity. In this discussion I shall consider principally cellulitis as we have seen and treated it in our oral surgery clinic at Freedmen's Hospital, and acquaint the reader with some of the paths of diffusion of this infection as worked out by F. A. Collier and Luis Yglesias.

First, I shall present, very briefly and in a general way, a group of cases which we have treated, and then discuss the paths of extension. Fifteen selected cases will be divided into three groups. In Group I are those cases of cellulitis which developed from pericoronal abscesses of the lower third molar region. The spread of the infection in the majority of these cases was in the space of the body of the mandible, and spreading somewhat lingually to the superficial sublingual space. The symptoms and clinical findings in each case were about the same. Examination revealed swelling of the jaw on the affected side which was in the submaxillary region, tenderness to touch and sometimes fluctuation. Deglutition was impaired and trismus present. Intra oral examination revealed inflammation around the lower third molar with pain on percussion and no areas of fluctuation. Of six of such cases, five required external incision and drainage after localization with external heat and supportive therapy, and one cleared up by resolution as result of sulfanilamide therapy and continuous heat lamp treatment for forty-eight hours. In each case the offending tooth was removed following the decline of the acute symptoms and relief of trismus.

In Group II are those cases which developed from improv-

erly treated alveolar abscesses, or those which were completely untreated and which broke down into a cellulitis. In all of these seven cases the infection spread through the space of the body of the mandible and lower masticatory space. The offending teeth were usually premolars or first molars. The swelling of the jaw on the affected side in each case was mainly at the angle of the jaw and downward for a short distance below the inferior border of the mandible. In two of these cases the swelling was fluctuant, so that immediate incision was made and drainage maintained. Five of the cases required localization with external heat before incision and drainage. In these cases also extractions were made after acute symptoms subsided and relief of trismus was obtained.

In Group III are those cases, and I have seen only two, in which infection from lower molar teeth traveled upward involving the masticatory space and the deep temporal space. Both of these cases proved very interesting.

Case 1. A young male, age 10. He was brought to the hospital acutely ill, with a temperature of 104° F. His blood count showed a definite leukocytosis, a lowered red cell count and hemoglobin 60 per cent. There was a swelling of one whole side of the face, including the temporal region. Oral examination revealed a loose lower first deciduous molar with caries. This was the only tooth on the affected side which looked even doubtful. The patient was confined to bed, sulfanilamide therapy begun, fluids by mouth forced and a transfusion given one day after admission. An attempt was made to localize the infection with external heat. On the third day after admission the patient died. At autopsy pus was found in the cavernous sinus and multiple abscesses in the brain and under the temporal muscle. Death was due to thrombosis of the cavernous sinus.

Case 2. A young male, age 18, presented with an indurated, painful swelling of the jaw in the pre-auricular area and at the angle of the jaw. He gave a history of having had a lower molar extracted one month previously. X-rays were taken and found to be negative. Oral examination showed nothing significant. Upon admission, there was no definite leukocytosis, but in two days the white blood cell count increased. An incision was made at the angle of the jaw, externally, and a caseous-like mass extruded. Two days later the

swelling increased, extending upward to the temporal region. Under local anesthesia, a vertical incision was made just back of the hair line over the temporal area, down to the temporal muscle. By blunt dissection the fibers of the temporal muscle were divided and dissection carried out down to the temporal bone. Here a pocket of pus was reached. A rubber tissue drain was inserted and the wound dressed with sterile fluff gauze. Supportive treatment was given and recovery was uneventful.

Were there a Group IV, it would include those cases of deep sublingual cellulitis known as Vincent's Angina, but our clinic fortunately has not treated one of these cases. I say fortunately, for the mortality rate in these cases is great. I have covered the most common of the cases of cellulitis of dental origin since it is one of these types that the general practitioner is more likely to see, judging from the frequency with which they occur in our clinic.

The spread of dental infection into four spaces has been mentioned: the mandible, the masticator space and the deep temporal space, which is really part of the masticator, and the superficial sublingual space. Dr. R. O. Dingman, associate of Dr. Sterling V. Mead, interprets very clearly the results of the research of Collier and Yglesias.

"Space of Mandible. The space of the body of the mandible is formed by a continuation of the superficial cervical muscular fascia and the middle cervical fascia, along with the free muco-periosteum overlying the alveolar portion of the mandible. The superficial cervical muscular fascial layer and middle cervical muscular fascial layer are fused as they pass upward above the level of the hyoid bone, but separate at the inferior border of the mandible. The outer layer becomes attached to and re-enforces the periosteum overlying the anterior and lateral surfaces of the body of the mandible, and the inner layer becomes attached to and re-enforces the periosteum overlying the medial aspect of the body of the mandible. The free, tightly adherent muco-periosteum overlying the alveolar portion of the mandible completes the space which extends from the symphysis to include the third molar region. An abscess in this space may break into the mouth cavity through the free mucous membrane overlying the alveolar portion of the bone on either the buccal or lingual surface; it

may break through the outside of the face by destruction of the periosteum covering the mandible; or extend to the tissues of the floor of the mouth by breaking through below the mucus membrane." This brings to light the path of spread in cases in Groups I and II.

"Masticator Space. The same layers of fascia that separate at the inferior border of the mandible to form the space of the body of the mandible also form the second potential muscular fascial space known as the masticator space. The superficial layer passes upward externally to the masseter muscle but deep to the parotid gland, Stenson's duct, seventh nerve and superficial temporal artery and vein. This layer passes upward over the zygomatic bone, to which it becomes attached, and from there upward over the temporal muscle to become attached to the periosteum of the temporal bone. The middle muscular cervical fascia passes upward medial to the ramus of the mandible to enclose the internal and external pterygoid muscles and becomes attached to the base of the temporal bone. The two layers fuse anteriorly along the anterior border of the masseter and temporal muscles, and posteriorly along the posterior border of the ramus and the temporal muscle. The masticator space contains the ramus of the mandible, all the muscles of mastication and the fat pad surrounding the attachment of the temporal muscle to the coronoid process. The upper part of the masticator space is divided into two portions by the temporal muscle.

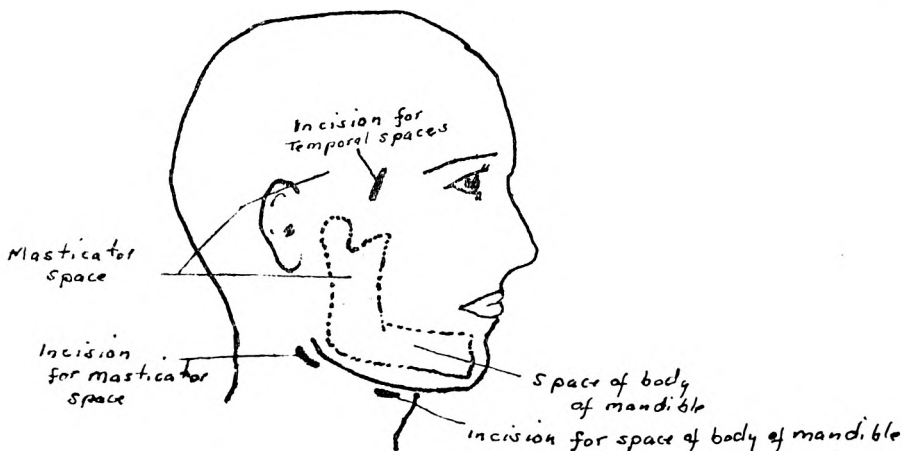
"That space between the temporal muscle medially and the superficial temporal fascia laterally is known as the superficial temporal space. The space bounded laterally by the temporal muscle and medially by the periosteum overlying the temporal bone is known as the deep temporal space." Cases in Groups II and III are included in this discussion.

#### *General Consideration of Cellulitis*

Symptoms: The patient usually presents with a considerable swelling on the affected side, an increase in temperature (102° F. to 104° F.), increased pulse and respiratory rate, a feeling of lassitude and apprehension. There is usually trismus and impaired deglutition. The swelling is very tender and may or may not be fluctuant.

Treatment: Local treatment consists of localizing the in-

fection by applications of moist heat (hot-water bag or heat lamp). We find hot magnesium sulfate compresses very efficacious. After sufficient localization has taken place, which may require from two to four days, incision is made in the proper area, keeping in mind the cosmetic effect of the scar. This incision should be made through the skin only and by means of blunt dissection with the butt end of the scalpel, or hemostats, the pus pocket is reached. An adequate incision is necessary for free drainage and prompt recovery. There may be several such pockets of pus, so it is necessary to dissect into them all. It is not a good policy to express the pus by



*The muscle-fascial spaces shown topographically.*

squeezing the tissue, but to open it up sufficiently for adequate drainage. Some operators mildly irrigate these pus pockets with some bland antiseptic solution or even normal saline. Drainage should be maintained. We favor the use of strips of rubber tissue drain material placed within the cavity with about one inch remaining out. Sterile fluffy gauze dressings should be changed as often as necessary. General treatment consists of rest in bed if acutely ill or weak, plenty of fluids by mouth. If patient is dehydrated or septicemia is pending, a hypodermoclysis or even blood transfusion may be neces-

sary. The patient's bowel movements should be regular, but do not give magnesium sulfate if sulfanilamide is being given. It may be necessary to administer a sedative; however, if sulfanilamide is being given, do not use morphine sulfate or codeine sulfate. Sulfanilamide therapy may be instituted as it is specific for streptococcus, which seems to be the dominant organisms in diffused infections such as cellulitis. It may be given (to adults) thus: forty grains the first day, thirty grains the second day and discontinue the third day. It should not be given in face of any drug containing a sulfate radical, and ten grains of bicarbonate of soda should be given with each dose to prevent acidosis.

In conclusion, I would like to emphasize the following: (1) A general knowledge of these potential muscular fascial planes is a great aid in the surgical management of cellulitis of dental origin; (2) Localization of the infection with heat, which may be dry heat, as with a heat lamp, or moist heat, as with hot compresses of water, or hot compresses of an astringent, if there is an open wound; (3) Adequate incision in the least conspicuous area, but where proper drainage may be obtained and maintained. I personally recommend an incision at least one inch long because wounds in the skin attempt to close very rapidly by granulating, thereby frustrating operative treatment. After incising the skin, remember to reach the pus pocket by blunt dissection alone, so as not to lacerate blood vessels or traumatize nerves. (4) Supportive treatment is very important; rest, plenty of fluids by mouth and sulfanilamide therapy; (5) Care of the wound; dressings should be changed as often as necessary and the wound kept clean to prevent contamination; (6) Lastly, judicious management of acutely abscessed teeth often prevents this diffused, phlegmon-like infection.

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