

## XXVIII.

### EPIDEMIC MASTOIDITIS.

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Any man who professes to practice otology and was not in the service during the fall and winter of 1917 and 1918, in my mind missed a great opportunity to witness one of the events in the annals of otology.

I happened to be in charge of the operative service at Camp Cody when the epidemic of streptococcus, pneumonia and mastoiditis hit us like a bolt out of a clear sky at the time we least expected such an unheard of and unprecedented catastrophe. Most certainly it was unprecedented, as it has been shown by other writers that precedent was set both as when to interfere surgically in acute mastoiditis as well as the postoperative care.

Just why such an epidemic should occur, there are a number of etiologic factors to be considered, but as yet of all the theories which have been advanced, none are satisfactory in explaining the true cause. True, it seems environment played a very important role, as the men were taken from all walks of life and thrust into an intensive training which they had to endure, and were not allowed to rest for some slight indisposition, but had to be quite sick to be admitted to the base hospital, no doubt all of this resulted in a lower physical resistance for some time until they became acclimated or had become hardened physically to stand the military routine. It was during this readjustment period these men were good subjects for any acute infection which might arise, notably acute streptococcic sore throat.

The streptococcus in its different types was the most important infection we had to contend with. This particular organism was not only an important etiologic factor in all primary infections, but played an important role as secondary infections following the acute exanthemas, such as measles

and scarlet fever. It seems this organism may be dormant, as it were, only waiting for an opportunity to become active upon any lowered resistance of its host.

I am convinced of this, as a number of the ward attendants had repeated cultures from the nose and throat, and they all showed a predominant streptococcus growth as well as a slight leucocyte count. These cultures and blood counts were taken weekly, and as long as the blood count showed a good resistance they were kept on ward work, but if a slight indisposition was apparent with low resistance these men were placed on other duty for a few days. In this way we were always able to keep our help in the mastoid ward up to very good efficiency.

It is not surprising, when one considers the foregoing, that we virtually had an epidemic of mastoiditis or at least sporadic, as we frequently had a number of cases from one company and not any from another, but from different battalions.

It was during December, 1917, and January, February, March and April, 1918, that we had such a large series of cases of (operative) streptococcus mastoiditis. From my observations I am convinced the mastoid is more frequently involved through the blood stream than was thought probable in the past.

*Symptomatology.*—Cases where the otitis media symptoms seemed to predominate and, say, slight pain over the antrum and a high temperature with a timely paracentesis, although the great percentage of these cases had gone on to rupture before they were admitted to the hospital—as a rule, this class will undergo resolution without surgical interference of the mastoid.

There is another class of cases in which the otitis media and mastoiditis appears simultaneously. A paracentesis is done at once, but the case is one of those fulminating types, and it is necessary to do a mastoidectomy in four or five days to relieve the pain. While the patient is very septic and may show a leucopenia, you then wonder how it is possible so much destruction could be done in such a short time.

Another class of cases were those complicating systemic diseases, such as measles. These cases would become involved

and the patient not aware of it until necrosis had taken place. These no doubt were infected through the blood stream.

Blood counts, if these were above 12,000, we watched the mastoid very closely. Headache is a symptom that to my mind is more important than is given credit, relative to complications of acute mastoiditis. A constant headache always means to me a dural irritation or a beginning meningitis.

Where precedent was set in this epidemic of streptococcus mastoiditis was the assurance of knowing just when to interfere surgically. This was determined by the following points, which I wish to emphasize: First, as a case was admitted, a culture was taken of the discharge, or at the time of the paracentesis a culture was taken. If this proved to be either pneumococcus or streptococcus, and at the end of the third or fourth day pain and tenderness still persisted over the mastoid along with a leucocytosis, also an occasional leucopenia asserted itself, we immediately opened the mastoid. A leucocytosis meant to us only an increased resistance, for some of the worst cases had a normal count or a leucopenia. Second, if the X-ray showed a large pneumatic mastoid along with history of sudden onset and continuous severe pain, this always meant early operative procedure. There is just one factor that stands out in acute mastoiditis which has always been more or less of guesswork, and that is bone necrosis. It is this factor alone that determines when we shall operate. If this could always be determined I believe our mortality following acute suppurative mastoiditis would be lessened. I believe we are nearer to this goal than ever before.

We have those classical cases. In these we have no difficulty, but the classical symptoms do not always appear. It is then we should rely on the X-ray, for it has been shown that when bone necrosis has taken place, in the absence of the classical symptoms operative interference should be instituted at once.

The Operation.—The operation for the removal of the mastoid cells is very much standardized, and I feel it is not necessary to discuss it here. Except I wish to make this statement that in the presence of a streptococcus infection it is best not to use the blood clot, as we tried it in twenty cases, and all but

three broke down. Of course this delayed the resolution, and I feel you are endangering the patient possibly to severe complications.

After-care.—We discovered it was best to use dry dressings along with rest and good food. We were disappointed with dichloramin-T. It is possible we did not use the proper technic. In the end we decided it was best to use dry dressings and let them alone.

Complications.—The two uppermost questions in our mind in any acute mastoiditis is the diagnosis of bone necrosis and complications. Our complications consisted of sinus thrombosis, brain abscess, meningitis, arthritis, endocarditis and a general streptococemia.

Sinus thrombosis is too well known to be taken up in detail, but there is one thing we proved, and that is that a sudden chill followed by a rise in temperature does not always mean sinus thrombosis, but we had so many complications arise that it was the opinion of all that the blood stream no doubt was infected prior to the development of the mastoid or through the lymphatics from the mastoid region and not through the lateral sinus.

Erysipelas was a frequent complication but never proved fatal. It prolonged the period of convalescence.

The one complication which was most dreaded was meningitis. The necropsies show this to be a more frequent complication of pneumonia than was at first suspected. In one case of mastoiditis complicated by meningitis it was shown at postmortem that temporosphenoidal and cerebellar abscesses were found. The heart showed multiple abscesses throughout, and cultures from the pleural cavity were positive for streptococcus.

#### CONCLUSIONS.

1. Why such an epidemic of mastoiditis should occur in our army camps, it is difficult to say that any one thing was the etiologic factor, but a number of factors are to be considered. The one important thing which stands out most were the complications associated with the acute contagious diseases, such as measles.

2. The mastoid may become involved through the blood stream or the nasopharynx route.

2. Bone necrosis is the most important thing to keep in mind. This can be determined by constant use of the X-ray along with clinical manifestations.

4. Those mastoids following the acute contagious diseases as complications, in all probability, get their start through the blood stream and give us the most trouble.