A CONTRIBUTION TO THE ETIOLOGY OF SEPTIC SINUS THROMBOSIS.*

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The otitic complications of the acute infectious diseases are frequent, and purulent otitis media, acute suppurative mastoiditis and septic sinus thrombosis find their greatest quota among these. While it is true that septic sinus thrombosis may be caused by a brain abscess or a meningitis due to other causes than otitic, and by contiguity cause the blood vessel infection, the vast majority of cases are those which have primarily or concomitantly attacked the middle ear and mastoid cells.

Influenza and the exanthemata undoubtedly are more frequently complicated with the more serious forms of acute ear disease than other infections, with pneumonia and typhoid following. There is, however, a series which follows the so called "cold," where there has been a purulent nasal discharge, little or no fever, and no prostration, and upon which an acute otitis media and its complications develop.

Whatever may be the bacterial etiology of the exanthemata, the fact remains that in the serious otitic complications which follow or accompany these diseases—especially scarlet fever and the more virulent form of measles—the hemolytic streptococcus is the organism most frequently found upon bacteriological examination. Occasionally the staphylococcus pyogenes aureus is found in the pus of the middle ear and mastoid cells, and rarely another organism. When the sinus becomes involved and the blood stream invasion manifests itself, these same organisms are found. First, the hemolytic streptococcus, which predominates so largely that other organisms found in sinus thrombosis complicating the exanthemata become a rarity; then, occasionally the staphylococcus aureus is found; and finally, very rarely, some other organism is found by culture of the thrombus, removed at operation, or recovered from the blood stream.

The streptococcus is hemophylic in character and feeds and thrives upon the red blood cells. Many strains of the staphylococcus aureus are also hemophylic in character and, proportionate to the virulence of the organism, produce hemolysins which destroy the red blood corpuscles. These virulent forms are rarely found in man, and it

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is therefore rare that a sepsis of otitic origin, due to a sinus thrombosis caused by this organism, occurs. The point to be stressed is that those forms of streptococcus or staphylococcus which are hemophylic are the ones which produce the sinus thrombosis or sinus phlebitis and cause the dangerous sepsis which accompanies the disease.

In the acute otitic complications occurring during pneumonia, the pneumococcus is frequently found in the pus in the middle ear and mastoid cells. Yet when these cases are further complicated by sinus thrombosis, the organism found in the blood stream is only rarely the pneumococcus; far more frequently—in fact, as a rule—the organism found is the hemolytic streptococcus. In this connection it is of importance to remember that the pneumococcus is non-hemolytic and non-hemophylic, and that although there is a pneumococcus septicaemia during the active pulmonic disease, the more severe complications not infrequently present other microorganisms; and that when sinus thrombosis occurs, the hemolytic streptococcus is the one most frequently found in the blood stream.

During the recent epidemics of influenza many cases of the severe otitic infections have been carefully studied in both civil and military hospitals. The bacteriology of these epidemics has not been entirely cleared; but whatever the causative organism or organisms in the disease itself, the bacteriologic findings in the complicating septic sinus thrombosis have been uniform. As with the exanthemata, the hemolytic streptococcus has been most consistently found in the blood stream. More rarely, the bacillus influenza has been reported. This bacillus is hemophylic in character and cannot grow in the absence of hemoglobin; and this further supports our theory that those organisms which are hemophylic in character are the ones which predispose the patient to the hematogenous infection.

This same condition appears to exist in the group of cases which apparently have their onset in the so-called simple purulent rhinitis, mentioned above. The middle ear and mastoid process may be infected by one of a number of different bacteria, and the condition may not appear serious. Yet in those cases where the hemolytic streptococcus is found, the prognosis should be more guarded, although as a rule the acute otitis caused by this organism clear without serious complications. The blood stream invasion may already be present, and is ever threatening if the disease in the mastoid cells is not completely eradicated. In this class, even when the organism found in the mastoid pus is other than the strepto-

coccus, that which is found in the blood stream is usually of the hemophylic group.

There is a small group of cases of sinus thrombosis in which organisms other than those of the hemophylic group have been recovered—namely, the pneumococcus, the streptococcus viridans, bacillus proteus, and others. But these cases are extremely rare, and some of those reported are undoubtedly terminal infections and not due to the original sinus thrombosis.

In conclusion, we wish once more to present our observation—that otitic infections which are caused by hemophylic microorganisms are the ones which strongly predispose to septic sinus thrombosis; and conversely, that septic sinus thrombosis is, in the great majority of cases, caused by the hemophylic bacteria.

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TONSILLECTOMY SUMP.*

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The tonsillectomy sump is the outcome of an endeavor to remove from the throat débré, which might not be caught with the ordinary fenestrated suction tube. The first instrument was a simple oblong bowl with suction applied through a tube about one-eighth inch in diameter.

The curves of the tube were later altered and the shape of the bowl changed so that the part overhanging the proximal end of the suction tube became square. The bowl was deepened at the sides by building up a square rim. It was found that by carrying the suction point to the distal part of the bowl and by having the tube enter at an acute angle the effect of gravity was secured and the entering suction hole was made larger. The square sides were again changed to a gentle slope from the rim to the bottom of the bowl.

The first work with this instrument was confined to the eversion operation—the tonsils being first grasped with a tenaculum and raised. Up to this point the ordinary fenestrated suction tube was used. The sump was then substituted and placed under the tonsillar area with the distal end of the bowl resting at the inferior pole of the tonsil. The assistant was instructed to keep the near

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