Surface tonsillar microflora versus deep tonsillar microflora in recurrent acute tonsillitis

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Recurrent acute tonsillitis is very common. We decided to reassess the reliability of the time honoured tonsillar culture in 100 patients suffering from recurrent acute tonsillitis. These patients underwent tonsillectomy eventually. The study demonstrated a marked difference between the surface microflora and the deep seated microflora of the tonsils. This finding cast a doubt as to the significance of the surface culture, taken from the tonsil during the latent period of recurrent acute tonsillitis.

Material and Methods

One hundred male and female patients with recurrent acute tonsillitis were arbitrarily chosen. Their ages ranged from 3 to 46 years; 80 per cent were 18 years old or younger. A culture specimen was taken at random from one of the tonsils at the time of operation. This was done with the patient under general anaesthesia, by rubbing the tonsillar surface thoroughly with a sterile swab. Following the tonsillectomy (dissection technique) several fragments of tissue were removed from the interior of the previously cultured tonsil. Precaution was exercised to avoid touching the surface of the tonsil and to keep the fragments uncontaminated. They were placed in sterile saline solution and transferred to the bacteriology laboratory in a sterile container.

The tonsil fragments were mechanically liquefied and cultured in four media: 1. Blood agar; 2. MacConkey; 3. Thioglycolate; 4. Chocolate agar.

The swab taken from the tonsillar surface was cultured similarly. A sensitivity test was performed if pathogenic bacteria were identified.

Results

One hundred surface cultures compared with 100 interior tonsillar cultures are presented in Table I. The bacteria isolated (according to prevalence) were: 1. Hæmophilus influenza; 2. Staphylococcus coagulase positive; 3. Streptococcus β haemolytic type A; 4. Pneumococcus; 5. E. Coli; 6. Pseudomonas aeruginosa; 7. Serratia; 8. Candida (Table II).

Discussion

In 48 tonsils (48 per cent) (Table I, No. 3+No. 4) a pathogenic micro-organism was identified from the interior of the tonsil, differing from the surface bacteria (pathogenic or otherwise).

A question arises as to the significance of the conventional culture, obtained from the tonsil and the therapy given accordingly, in recurrent acute tonsillitis. Recurrent tonsillitis may be caused by the development of strains resistant to penicillin among the streptococcus and staphylococcus groups (Sprinkle and

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TABLE I.

COMPARISON OF CULTURES TAKEN FROM TONSILLAR SURFACE AND EXCISED TONSIL

	Per cent
Tonsillar surface Normal flora Excised tonsil	33
Tonsillar surface Identical pathogens Excised tonsil	15
Tonsillar surface Different pathogens Excised tonsil	9
Tonsillar surface—Normal flora Excised tonsil —Pathogens	39
Tonsillar surface—Pathogens Excised tonsil —Normal flora	4

TABLE II.

COMPARISON PATHOGENIC MICROFLORA ISOLATED FROM THE TONSILS

Pathogenic microflora	Tonsillar surface swabs	Excised tonsillar swabs
Haemophilus	12	40
Staphylococus Coag. Positive	8	15
A β Haemolytic Streptococcus	9	9
Pneumococcus	1	5
Escherichia Coli	1	1
Pseudomonas Aeruginosa	—	1
Serratia	—	1
Candida	1	—

Veltri, 1974). Failure to achieve bactericidal level of the antibiotic inside the tonsil results in bacterial survival. It is possible that the fibrous capsule, formed at the tonsillar bed after repeated infections, serves as a barrier to antibiotic penetration. The best treatment for these patients is by surgical extirpation.

Sprinkle and Veltri (1976) report a physiologic effect subsequent to adenotonsillectomy. They describe a decrease of the percentage of pathogenic bacteria and an increase of resident normal bacteria following surgery (Sprinkle and Veltri, 1976; Sprinkle and Veltri, 1974; Veltri *et al.*, 1972). Recent published papers on cryosurgery of the tonsils claims that the foci of bacteria are not deep seated. Cryotonsillectomy is thus claimed to eliminate tonsillar infection. Schousboe and Aastrup (1976) compared cryosurgically treated patients to patients who underwent tonsillectomy. In the first group 82 per cent of the patients had a satisfactory result in the first postoperative year. The second group (surgical therapy) showed a statistically significant higher percentage (93 per cent) of satisfactory results.

Only about $\frac{1}{2}$ cm. of tissue can be reached by the cryosurgical unit (using nitrous oxide). Pathogenic bacteria in deep foci within the tonsil are not affected

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by this method. We think that deep tonsillar microflora have to be considered as a very significant factor in recurrent tonsillitis. Only standard tonsillectomy can eliminate deep seated pathogens; antibiotic therapy or cryosurgery cannot serve as substitutes.

Summary

One hundred patients suffering from recurrent acute tonsillitis were studied. One hundred tonsils were cultured. Surface bacteria were compared to deep bacteria. In 48 per cent of the cases a different pathogen was cultured from the interior of the tonsil as compared to the surface culture. This fact may explain recurrence of tonsillitis and makes the reliability of the conventional tonsillar culture questionable. Surgical extirpation of the tonsils seems to be the only treatment since deep bacteria remain unidentified and resist the antibiotic therapy that may affect only the surface microflora.

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