Ocular distress, the dentist and the alveolar process

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THE RELATIONSHIP OF ocular distress to the presence of infected teeth and jaws is not a new concept. It is illustrated in the *Textbook of Ophthalmology* by Sir Duke Elder with a case recorded as early as 2250 B.C.[1]; Dr. Benjamin Rush, one of the signers of The Declaration of Independence, made record of similar experiences.[2]

In the present era, however, it seems to be more the rule than the exception to divorce the mouth completely from the body. You do not need to look for proof: insurance companies rarely pay dental claims; physicians seldom look in the mouth for the etiology of physical complaints.

There was a time in medicine when physicians would refer patients to dentists for examination and, when necessary, extraction of teeth. This was when the theory of focal infection was popular. Many people lost their teeth; some would regain health to a degree, then return to their primary complaint. Some conditions would become worse. As a result, the medical as well as the dental profession have nearly ceased to consider an infected mouth as an etiological factor in disease.

In 1952, Arthur Alexander Knapp, M.D. wrote: "Focal infection to me without question is the greatest producer of intraocular disease of the globe and a captain of the causes of blindness . . . once the entire nose and throat field has been declared free of infection and the eye disease has not been cured, the second area of great interest is the oral, for within its opening lies the secret of much resistant and persistent ocular pathology. Often after the cure of a dental focus a formerly refractory eye lesion will clear quickly. On some occasions it has been necessary to refer the same patient to two dental surgeons in order to discover a focus, just as it has been in regard to otolaryngologists. The prevention of blindness is sufficient reason for a double check."[3]

Dental X-rays Do Not Reveal All

If careful examination of techniques is made, one can readily understand the reason for failure in eliminating systemic complaints originating in an infected mouth. Think for a moment of your past experiences!

Perhaps in the examination of a patient, an infection above the shoulders (drainage type) is discovered or is suspected. This, of course, precluded the successful prescribing of glasses. Examination by a physician revealed negative findings. You then referred the patient to his family dentist, who probably took x-rays. The findings were negative and the dentist, too, gave the patient a clean bill of health. *Herein lies the error in the examination!*

X-rays, if perfect, will reveal only approximately 14 per cent of what is found in the mouth. X-rays are shadows and bacteria do not cast visible shadows! Consider your shadow as cast at noon and again at five P.M. on a bright sunny day. The distortion between these times throws light on x-ray errors.

Nearly all dental x-rays are bent when exposed, thus the recorded image is like

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the curved mirror. An abscess does not always show on the x-ray film!

Impossible you say. Kutler advances a valid reason: "Lesions in cancellous bone cannot be detected roentgenographically. It isn't until the usually later stage when the inner surface of the bone cortex has been eroded that it shows up on the film. Until then extensive disease of the bone tissue could be present and not noticed on your x-ray film."[4]

Most dental examinations are made with the following in mind: 1) can I save the teeth; 2) what can I put back; 3) what type of therapy can the patient afford; and 4) if the tooth doesn't hurt, should I leave it alone?

In consideration of the last comment, W. W. Duke, M.D. makes the following statement: "It is interesting to mention the fact that a vital nerve can be exposed to the infected material of an abscess for years and yet fail to cause a single symptom which attracts the attention of the patient".[5]

Many dentists have failed to realize the significance of the words of William Hunter, an English physician, given in 1910: "No one has more reason to appreciate the ghastly tragedies of oral sepsis which his (the dentist's) misplaced ingenuity so often carries in its train. Gold fillings, gold caps, gold bridges, gold crowns, fixed dentures built in, on and around diseased teeth, form a veritable mausoleum of gold over a mass of sepsis to which there is no parallel in the whole realm of medicine or surgery."[6]

It can be easily seen, therefore, that when a patient is examined with the above viewpoints in mind, how the presence or absence of infection of teeth and jaws would mean very little.

Determining the Vitality of Teeth

Frequently I have been asked by optometrists, "if x-ray doesn't show all types of dental infection, what can you do to find evidence of the infection that we feel, from our visual examination (including caecanometer chartings or color fields), must certainly be present?" There is much to do.

First of all, the x-ray is a directive for further search, a starting point and a guide. Any trip to be successful ordinarily requires a road map; this is essentially why x-rays are taken.

A careful history of past and present complaints is imperative.

Hematology, a thorough blood work-up, also helps to complete the picture of the patient's condition. The trained professional realizes that in most cases of dental involvement the white cell count will usually not be elevated more than 9,000 per cm. There will be little or no change from normal in the sedimentation rate.

Blood pressure usually has an elevated diastolic reading.

Urinalysis may reveal the presence of white blood cells, albumin, pus cells and, many times, bacteria in the urine. Yet, x-rays, hematology, urinalysis and history of past and present complaints, though revealing a great deal, do not give a complete picture.

An examination of *each* tooth must be made for vitality. (Vitality indicates the life of a tooth).

The electric pulp tester or vitality meter and many other modern fancy gadgets will seldom give the information obtained with a piece of ice.

Ice carefully applied to the middle third of a tooth should elicit a sensation from a patient in a matter of a few seconds. If this does not occur, a similar tooth on the opposite side of the arch should be checked and a comparison made. (Non-vital normals cannot be established arbitrarily by comparing one tooth with a corresponding tooth in the arch, because "normal" would not be obtainable if one tooth was non-vital.)

Non-Vital Teeth are Dangerous

As a "rule of thumb", however, any tooth which fails to react to stimuli within six seconds is non-vital.

One non-vital tooth may mean the sight of an eye, a chronic illness or even the life of a patient. Bacteria, continuously deposited in the blood and lymphatic systems, subsequently locate and in turn generate colonies

of bacteria, reproducing themselves every few seconds, leading often to bacterial endocarditis, iritis, nephritis, cholecystitis, to mention but a few.

We are fortunate that the defense system of the body reacts so rapidly that the bacteremia and toxemia is quickly reduced; thus, we do not lose many patients from careless extractions. But, neither do we obtain recovery of health.

Sir Duke Elder presents four distinct ways wherein bacteria may cause ocular disorders[7] and also cautions against the examination of the mouth by the average dentist.[8]

When a dentist recommends extraction of teeth, it may be well to remember the words of Frank Billings, M.D.: "Deplorable as the loss of teeth may be, that misfortune is justified if it is necessary to obliterate the infectious focus which is a continued menace to the general health."[9]

The Alveolar Process

Perhaps, a patient has had his teeth extracted and upon examination you find no improvement in the visual findings. It is quite interesting to note in the Billings' text *Focal Infection*, there is seldom any reference made to infected teeth. The author frequently refers to "infected alveolus."

What is meant by the "alveolus"? Medical dictionaries define the term as the residual hole previously occupied by the roots of teeth. Since a hole would not, per se, be infected, we must assume that the surrounding areas were meant by Billings. The surrounding areas are, of necessity, the alveolar process.

To understand alveolar process we refer to the work of William L. Shearer M.D., D.D.S. of Omaha, Nebraska. His findings are largely corroborated in *Gray's Anatomy*[10], Sicher's *Oral Anatomy*[11], Goldman's *Periodontia*[12], and many others.

Shearer, following clinical and laboratory examination of 1800 jaws from 1906 to 1918 presented the following premise: "The alveolar process is a transitory type of bone which grows only with the eruption and growth of teeth and should be removed when the teeth are lost . . . one of two things occur when simple extractions of teeth are made. Either the alveolar process is gradually absorbed and a knife ridge is formed, osteosclerotic in character, so sharp that it would cut the ungloved finger if it were passed over it with a little pressure; or, if the alveolar process does not absorb and the cortical tissue of bone is slightly hard, thus precluding the possibility of normal absorption taking place, decomposition of the cells of the alveolar process takes place and remains in the body of the jaws forever as a low-grade infection".[13]

E. C. Rosenow's works, published in 1918, are compatible with Shearer's findings: "It is becoming more and more apparent that the lack of improvement in systemic disease following the extraction of one or more infected teeth, barring other foci, may be due to the fact that the peridental infection was left or was only partially removed; also that the occurrence of acute exacerbation following extraction and curettement is commonly due to this cause. Persons who have had all their teeth extracted may still harbor localized areas of infection in the jaws. Simple extraction is not sufficient. The importance of eliminating dead spaces in curing infections of bone in other parts of the body—a lesson learned during the war—lends support to the idea of the 'surgical removal' of teeth".[14]

The most common site of the "void" referred to by Rosenow is unquestionably in the alveolar process.

The most effective method for the removal of infected teeth and processes (alveolar process, granulomas) from the jaws is the Shearer Alveolectomy. This operation designed by Shearer and presented to the profession in 1904 is a surgical procedure which will restore health to the patient as fast as possible, if dental sepsis is the etiology of the disease.

Give these precepts serious consideration! With the recurrent findings that infected teeth and jaws have a direct relationship with ocular distress, it would seem mandatory that optometrists and ophthalmologists more than ever be brought to the realization

that the presence of oral sepsis may destroy their efforts and cause failure to achieve desired end results. ■ ■ ■

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REFERENCES

1. DUKE ELDER, SIR STEWART *Textbook of Ophthalmology: The Ocular Adnexa* Volume V, C. V. Mosby Co., St. Louis, Mo. 1952 pp 5628.
2. DUKE, WILLIAM W. *Oral Sepsis in its Relationship to Systemic Disease,* C. V. Mosby Co., St. Louis, Mo. 1918 pp 17.
3. KNAPP, ARTHUR ALEXANDER, "Healing of eye disease by cure of oral foci" *Oral Surgery, Oral Medicine & Oral Pathology* 5:8 August 1952, pp 802-803.
4. KUTLER, BENTON "You might like to know" *The Chronicle of the Omaha District Dental Society* 25:2 October, 1961.
5. DUKE, WILLIAM W. *Oral Sepsis in its Relationship to Systemic Disease,* C. V. Mosby Co., St. Louis, Mo. 1918 pp 41.
6. COLMAN, GEORGE H. "Present status of concept of focal infection" *JAMA* 151:4, 1953.
7. DUKE ELDER, SIR STEWART *Textbook of Ophthalmology: The Ocular Adnexa* Volume V, C. V. Mosby Co., St. Louis, Mo., 1952 pp 5432.
8. Ibid pp 5685.
9. BILLINGS, FRANK *Focal Infection* The Lane Medical Lectures, D. Appleton & Co., New York-London, 1917.
10. GRAY, HENRY *Gray's Anatomy* Lea & Febiger, Philadelphia, Pa. 24th Edition, 1942 pp 148.
11. SICHER, HARRY *Oral Anatomy* C. V. Mosby Co., St. Louis, Mo., 1949 pp 129.
12. GOLDMAN, HENRY M. *Goldman's Periodontia* C. V. Mosby Co., St. Louis, Mo. 2nd Edition, 1949 pp 23-24.
13. SHEARER, WILLIAM L. "Management of Morbid Processes of the Jaws" Address given at the 31st Annual Meeting of the American Society of Oral Surgeons, October 1949.
14. ROSENOW, E. C. "Studies on elective localization" *Journal of Dental Research* 1:3.

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