

Dental Foci of Infection

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Historical

The concept of the haematogenous transportation of bacteria or toxic products from septic dental foci causing the occurrence of pathologic lesions in other parts of the body is largely due to William Hunter, who aroused great interest among both the medical and dental professions with his inauguration lecture at McGill University in Montreal, published in the "Lancet" (1911). He indicted the poor type of conservative dentistry as being the cause of rheumatic and other chronic diseases such as anaemia, gastritis, colitis, fevers of unknown origin, diseases of the kidneys and others.

It would not, however, be entirely fair to attribute the origin of the theory of focal sepsis to Hunter; other writers had previously drawn the attention of medical practitioners to the ill effects of septic teeth on the general health, though it appears that their convictions found no favourable acceptance. Rush (1818) mentioned various cases illustrating the relation between dental infection and certain evil consequences in the general system; he described the disappearance of rheumatic pain in the hip following the extraction of an aching tooth. Koecker (1828) in his book "Dental Surgery" stated that "one can always assume"... in rheumatic diseases "that the teeth play a principal role if they are not in good condition". A case of rheumatic fever cured after the extraction of a tooth had not escaped the notice of Hippocrates.

Closely linked with the idea of metastatic infections from dental foci is Rosenow, whose experiments have stimulated many research workers to

study this subject further. By injecting into animals bacterial cultures from the peridental tissues of patients with chronic arthritis, rheumatic fever with endocarditis, peptic ulcer, cholecystitis etc. he described the production of similar lesions in the injected animal; and for this mode of infection in which organisms are conveyed to a tissue for which they have affinity he introduced the term "elective localisation". Of the early investigators outstanding on the dental side were Weston Price and Thomas Hartzell, on the medical side Billings, Mayo and others. The idea spread widely and the name of research workers is legion.

In the twenties there was an unusual emphasis on this aspect of medicine, which resulted in the adoption of extremely radical measures, ruthlessly sacrificing useful teeth with frequent disregard to less obvious foci of infection. The radical element of the profession, who rendered their patients edentulous whenever they did not care to discover other causes for systemic disturbances, brought the theory into disrepute. Teeth were extracted in a routine fashion without any such indication. It appears that no sound criterion was followed to evaluate which teeth were acting as foci of infection; as it still often the case, the physician's knowledge of dentistry was very limited and the natural repulsion towards dirty, stained crowns of teeth may possibly have been the sole reason for which the wholesale destruction of the masticatory organ used to be advised. Another cause of disappointment was the failure of a cure in those cases where secondary foci had already established themselves with irreparable damage.

Bacterial Dissemination.

The circulatory invasion of oral bacteria following the extraction of teeth, septic or not, has been definitely established by the experiments of Okell and Elliot (1935), while Round, Kirkpatrick et alia have also produced temporary bacteriaemia in patients with unhealthy paradental tissues by making them chew on hard food. In plain terms, patients with septic peridental pockets have their bloodstream invaded with bacteria as often as they eat. The question arises, therefore, whether these circulating micro-organisms can be regarded as completely innocuous. Another question as well would require to be settled, whether the absorption of bacterial metabolites, the proteolytic ferments elaborated by the leucocytes and the tissue break-down products can be considered entirely harmless.

The role of stomatogenic sepsis in the causation of infective endocarditis has been accepted and proved beyond doubt. It is thus a matter of routine for the physician to take the necessary precautionary measures in connection with the extraction of teeth in patients with valvular lesions. On the other hand, the physician who invariably advises his rheumatic patient to refrain at all times from having a tooth extracted is certainly not pursuing a counsel of perfection. As long as the septic tooth is left in the mouth it is a continuous menace, as every act of hard mastication pumps bacteria into the circulation, though admittedly not to the extent caused by the extraction. Protecting his patients with antibiotics and relative rest, the dental surgeon should cause the absolute minimum of trauma during extraction and should observe scrupulous aseptic measures.

In normal individuals the occasional dissemination of bacteria into the cir-

ulation is adequately dealt with by the reticulo endothelial system. Still it is questionable whether the continuous effort to eliminate bacteria may not strain the defensive mechanism or weaken its resistance. At the same time one should not lose sight of the fact that death of the micro-organisms is only one stage in the elimination of the noxious material; the products of bacterial dissolution are protein in nature and as such they are capable of setting up anaphylactoid phenomena.

Closed Sepsis.

It has already been pointed out that besides providing the bacteria, a septic focus continuously furnishes a supply of intoxicating material which is absorbed into the lymph and blood vessels. Considered from this point of view a focus of infection is appropriately called a "focus of intoxication". The intoxicating agents include the end products of bacterial metabolism and the tissue breakdown products which belong to the group of H-substances. It is quite within scientific reasoning that these circulating foreign protein substances act as antigens stimulating the production of antibodies, and the simultaneous presence of both may give rise to allergic phenomena. As anaphylaxis is of a rather complex nature and its occurrence involves multiple causative factors, it is conceivable that a particular patient may become sensitised to the various bacterial metabolites and tissue breakdown products where a normal individual would not; or, that the protein absorption products may provide the missing link in the setting up of anaphylactic reaction.

It is significant that joint pains and effusion into joints are among the symptoms of allergic reactions. It may not have been proved how the circulating noxious matter elects to become fixed in the cartilage matrix of a joint,

but, Fish has alluded to the similarity of this phenomenon to the fixation of uric acid from the blood on to the joints of gouty patients. On the other hand one cannot expect to cure rheumatoid arthritis by the extraction of teeth once the joint lesion has established itself. The treatment of certain diseases lies mainly in their prevention.

Until the subject has been more clearly elucidated a conservative view is rightly justified, but one's contention is that focal sepsis provides an additional load on the general resistance, impairing the defensive powers and contributing to the degenerative changes of various organs, circulatory or excretory, overworking those with detoxicating function. It is a common clinical experience of the practising dental surgeon that the patient who has had his teeth extracted on account of advanced paradental disease experiences an unusual sense of well-being and fresh vitality. It has been frequently noticed that the diabetic patient benefits appreciably in this respect; every type of infection aggravates the diabetic ailments and the elimination of dental sepsis relieves the strain on the internal secretory system of the pancreas. In degenerative diseases of the kidneys the elimination of foci of intoxication is appropriately indicated as an essential part of the treatment, and the patient is all the better for the loss of his teeth. The view that the degeneration of the vascular system is aggravated by circulating toxic products is still tenable. If this concept is correct, prophylaxis early in the course of the disease should be foremost in the line of treatment. It cannot be overemphasised that treatment should be instituted as early as possible; and the early elimination of foci does not necessarily entail the loss of teeth.

Open Sepsis.

Superficial septic mouth lesions, such as pyorrhoeic pockets, which drain into the oral cavity may form foci from which sepsis is spread to situations in direct communication with the mouth. Septic material trickles down the pharynx, smearing the tonsils and the pharyngeal opening of the Eustachian tube. It is assumed that swallowed mouth bacteria are destroyed in the stomach and exert no further harmful effect on the rest of the gut though Hunter expressed his doubt whether the continuous swallowing of pus organisms is tolerated indefinitely by the stomach mucosa.

Pus discharged from gingival pockets or through fistulae draining apical infections reaching the pharynx may be inhaled into the lungs. In chronic laryngeal inflammations, one has noticed occasional clinical response to the elimination of dental foci. Proske and Sayers placed great emphasis on diseases of the teeth and gums as the cause of the putrid bronchial and pulmonary diseases occurring in silicosis, fuso-spirochaetal organisms becoming an important factor if the way is prepared by the rock particles. In patients who sleep with their mouth open and snore, bacteria, enveloped in moisture globules may be aspirated into the bronchi; and though these micro-organisms may be relatively avirulent to the healthy lung, they may not be harmless in association with chronic inflammatory diseases. The possibility that infected material in the pharynx may find its way into the lungs is not unrealistic considering that oil from nasal drops may reach the bronchi. In such manner the asthmatic patient may inhale a continuous supply of allergen, and his feather pillow or his pet may be blamed unnecessarily. It appears that this source of supply of additional infective material in chronic diseases

of the bronchi is not sufficiently appreciated.

There has certainly been an overstatement of the role of oral sepsis in general diseases, and from the days when the idea was accepted with uncritical enthusiasm the pendulum has swung a little too far the other way. Owing to the many difficulties encountered in establishing the evidence of

casual relationship between the primary focus and the metastatic lesion a sense of frustration, often amounting to stark scepticism, has crept in. It is, however one's contention that the original theory has not been thoroughly investigated, that the concept of focal sepsis is a biologic possibility, and that oral prophylaxis contributes materially to the prevention of a multitude of ailments.

References.

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