and total acidity followed more or less normal curves. Free HCl went up to about 30 (N/10 NaOH) one and a quarter to one and a half hours after partaking of the meal, and the total acidity to 55. There was no odour in any of the samples, and no blood, bile, or lactic acid; starch was present up to one and a half hours, and resting juice amounted to 10 c.cm.

Throughout the long courses of treatment with liver, ventriculin, and multiple vitamins, reticulocytes never exceeded 2 per cent., and usually they could be found only after long searching. Under treatment with multiple vitamins the patient, for the first time, showed steady and marked improvement, which reached its maximum degree (3,840,000 red cells per c.mm.) at the end of about two and a half months. At this point, however, in spite of continuation of the treatment, he quickly relapsed, and died a month later with a red cell count of 660,000 per c.mm.

The case, therefore, was resistant to liver therapy and to treatment with desiccated extract of stomach tissue. Although a marked improvement took place under treatment with vitamins A, B, C, D, and E, it was not maintained; and knowing the tendency of the disease to show periods of natural remission even without treatment, one cannot avoid the conclusion that this may be the explanation, and that vitamin deficiency *per se* is not an essential factor in the causation of the disease. For two weeks before he died he was given both liver extract and ventriculin, but without effect. On three occasions also the other forms of treatment were reinforced by blood transfusion, but the progress of the disease was not influenced thereby.

SUMMARY

- (1) A case of Addisonian pernicious anaemia, which resisted treatment by (a) liver and (b) desiccated extract of stomach tissue, is recorded.
- (2) Treatment with multiple vitamins (A, B, C, D, and E) was tried, and improvement took place for two and a half months, but was not maintained, and relapse ensued.
- (3) Liver extract and desiccated extract of stomach tissue were then given, but the relapse progressed and ended in death.
- (4) Blood transfusions also did not influence the condition.
- (5) The improvement which took place under multiple vitamin therapy may have been but a natural remission of the disease, and so vitamin deficiency *per se* may not be an essential factor in its causation.

REFERENCE

- ¹ *Journ. Amer. Med. Assoc.*, 1926, lxxxvii, 476.

SUBACUTE BACTERIAL ENDOCARDITIS FOLLOWING REMOVAL OF SEPTIC FOCI

BY

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The eradication of septic foci, particularly in connexion with teeth or tonsils, is advocated in all textbooks of medicine. Such advocacy belongs to the realm of elementary teaching, for it is realized that a large number of cardiac patients owe their death to the supervention of subacute bacterial endocarditis, and it is presumed on reasonable grounds that infection in such cases derives from teeth or tonsils. Yet the removal of septic teeth or tonsils in cases of chronic heart disease does not constitute quite so simple a problem as appears on the surface. This is amply demonstrated by the following cases in

which subacute endocarditis supervened upon removal of septic foci—teeth (two cases) and tonsils (one case)—in circumstances which leave no doubt that the fatal issue was the result of removal of these foci.

CASE I

A man, aged 39, was seen by me on June 24th, 1925. He had been informed twelve years previously that he had well-compensated mitral regurgitation. From this he had experienced no symptoms whatever. In the middle of January, 1925, he consulted a dentist, who extracted five teeth under local anaesthesia. A week later six more teeth were extracted. Shortly after the extraction he noticed small red spots on his fingers. These were attributed by him to the effects of the cocaine used in the extractions. Soon afterwards he noticed stiffness of his calves and thighs. On April 25th he developed sudden loss of power of his right arm and leg, without loss of consciousness. When I saw him strength had returned to his limbs, but a number of petechiae were noted on his fingers. These were, he stated, similar to the earlier spots. His temperature showed an evening rise varying from 99.4° to 101°, while his pulse rate varied from 90 to 120. Examination showed the presence of mitral regurgitation, without enlargement of the heart. Blood culture yielded a growth of *Streptococcus viridans*.

The next event in the case was the appearance of tender nodules on a finger, on the right arm, and on the right buttock. Crops of petechiae appeared from time to time in various parts. On July 25th sudden pain was felt in the right shoulder. This lasted for two days, and was followed by a shower of petechiae in the region of the right clavicle and scapula. More tender nodules were observed on the left wrist, left leg, and buttock. On September 20th, 1929, intense pain was experienced in the back of the head. This was followed by unconsciousness and, in a few hours, by death.

CASE II

A male, aged 21, had a history of rheumatic fever in childhood. A year after this infection he was able to indulge in vigorous exercise without discomfort. After a time he hunted, and rode in point-to-point races with considerable success. In July, 1929, he obtained his degree, but failed to pass the medical examination for the British Army. Until this time he was quite unconscious of the presence of any defect in his heart. The result of his medical examination caused him considerable surprise, and he thereupon consulted a London cardiologist, who found a valvular lesion, and advised removal of tonsils, which were, he found, in a septic condition. The tonsillectomy was followed by pyrexia, and ten days later the patient returned to Ireland. On the evening after his return he had a violent pain in his right hip, and was then seen by Dr. Drennan, who has kindly permitted me to publish this case. Examination revealed a good deal of sepsis in the throat, swelling and tenderness of the right hip, a temperature of 103°, and a pulse rate of 120. An aortic diastolic murmur was heard.

After some days the throat condition improved and the swelling of the right hip subsided. The temperature came down, but failed to reach the normal, and for some weeks there was an evening rise towards 100°. Pain and swelling attacked a number of joints, and with this a progressive anaemia became apparent. Six weeks after his return to Ireland I was called to see the patient. The throat was still septic, the temperature was 102°, and the pulse rate 120. The patient looked extremely pale, almost ashen; a few petechial spots were seen on the legs, and there was considerable sweating. The heart showed moderate enlargement, with aortic and mitral regurgitation. Blood culture yielded a pure growth of *Streptococcus viridans*. The course of the infection after this date followed the lines previously exhibited. Remissions occurred in which the general condition improved and the temperature fell, though never reaching normal. After each remission an exacerbation was ushered in by joint-pains, weakness, increased pyrexia, and sweating. Cardiac enlargement became more marked, and anaemia more profound. After seven months death ensued from cerebral embolism.

CASE III

Male, aged 53, suffered from a sudden attack of auricular fibrillation in September, 1927. He came under the care of Professor T. G. Moorhead, who has kindly permitted me to record his case. During a period of eighteen months after his initial attack of irregularity, repeated attacks occurred of paroxysmal fibrillation with some flutter. The heart showed moderate enlargement, with a systolic murmur maximal in the mitral area. Complete examination failed to show any cause for the irregularity. His teeth were carefully examined by a dentist in November, 1928, and were pronounced sound. Early in 1929 the patient began to suffer from some discomfort with his teeth, and a general deterioration of health was noted, as evidenced by considerable loss of weight, with increasingly frequent incidence of fibrillation. In April, 1929, he consulted a London cardiologist. His teeth were x-rayed and two roots were condemned. Removal of all his teeth under local anaesthesia was recommended. In May, after an abortive attempt to improve the condition of pyorrhoea which then existed, two teeth were removed without difficulty, the only anaesthetic employed being cocaine, which was simply painted on the gums. On June 27th another tooth was removed. This extraction proved difficult, and some novocain was injected into the gums. Following the extraction the gums continued to bleed for three days. The bleeding ceased after application of adrenaline. On July 1st a purpuric eruption occurred all over the body. On the next day there was pronounced haematuria, and oozing of blood was noted all over the surface of the palate and from the gums. Haemostatic serum and antistreptococcal serum were administered and the bleeding ceased. Four days later there was haemorrhage from the stomach and bowel, and, from this on, the patient was mildly pyrexial. Blood culture was negative. At this time I saw the patient in consultation on two occasions. No marked change was noted until August 14th, when he was apparently much better and able to go for a drive. On the next day he was not so well, and was again feverish. Haematuria once again appeared, and there were more purpuric spots. Two days later it was noticed that the left arm was paralysed. Half an hour later the left leg was paralysed, and still later the left side of the face. Towards evening there was severe haematemesis, after which the patient sank into coma and died.

COMMENTARY

It will be seen that in two of the cases recorded above there was no symptom or sign of endocarditis until the removal of septic foci. The first patient had experienced no disability whatever from his heart lesion, and consulted a dentist because of trouble with his teeth. The second patient was led to consult a cardiologist because of rejection for the Army. His valve lesion had not interfered with indulgence in strenuous exercise. The third patient had presented a number of symptoms before the removal of teeth, but the terminal illness was closely associated with an extraction. I feel justified in including his case in this paper in spite of negative blood culture, as the circumstances associated with his death point the same moral as the other cases.

Many interesting problems arise from consideration of these cases. If proof were needed that infection in subacute endocarditis may derive from teeth or tonsils, such cases would supply the necessary evidence. Paradoxically, then, they emphasize the importance of removal of septic foci, but they stress the need for great caution. Removal of more than one or two teeth at a sitting in patients with disease of the heart is clearly unwise. Unless there is a definite periapical abscess it would seem equally unwise to risk dissemination of infection by removing teeth which are very firmly fixed and require much manipulation. General anaesthesia should on a *priori* grounds be preferred to the use of local anaesthesia. Preliminary vaccination with an autogenous growth from

the gums or tonsils seems a rational procedure. Careful supervision of teeth in patients with disease of the heart should obviate the necessity for wholesale extractions. Crowning of teeth in such patients and the preservation of dead teeth are both to be condemned. It is better to sacrifice a comparatively useful tooth at a stage when its removal is unattended with danger, than to preserve it in a condition in which it is likely to become severely infected and a source of danger whether it be left or removed.

THREE GENERATIONS OF INHERITED DENTAL DEFECT

BY

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Congenital absence of certain teeth is a relatively common condition which sometimes occurs in family groups, but gross suppression of the majority of the teeth in members of three consecutive generations of the same family is rare.

Recently a woman attended an infant welfare centre with her only grandson, a boy 8 months old, who had six teeth already erupted. Mention of these teeth led the woman to volunteer the statement that her own two widely spaced teeth were the only ones she ever possessed. These peg-shaped teeth, occupying the place of the lower central incisors, appeared when she was about the age of 7, and are still strong and sound, being implanted in firm gums, which, she says, have always been capable of dealing unaided with all kinds of food except nuts. During childhood, complete closure of the mouth was impossible owing to hypertrophy of the gums, but it was not until she reached the age of 19 that, goaded by her companions' constant teasing on account of her toothlessness, she sought advice at the local hospital. Two "levelling" operations ("for double odontoma," she says) took place, after which the gums shrank to their present normal proportions, and she was able to close her mouth naturally.

Her memory regarding the results of x-ray examination then and later is vague; but apparently when she was 19 a few rudimentary teeth were said to be present, and again, twenty-seven years later, when she was in another hospital for gynaecological treatment "almost a full set of teeth" was found. Operation on the mouth was then suggested, but she would not agree to this as her bite was satisfactory, and her enunciation clear and unusually

good. She is one of a family of four, all the others having normal dentition. Her age is 46, but her appearance is that of one twenty years or so older. She is stout and florid, and her abundant dark hair is going grey. "A complication of disorders"—the graphic phrase of some former biographers—might sum up her past and present health, for she has never been strong, having suffered from "chronic bronchitis, gall-stones, appendicitis, and displaced kidney," and having had, eight years ago, after several curettages, a major gynaecological operation, of the nature of which she is unaware.