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President—A. M. ZAMORA, F.R.C.S.

Discussion on Osteomyelitis of the Maxilla

THE OPENING PAPER BY MR. RONALD MACBETH APPEARS ON PAGE 18

SIR WILLIAM KELSEY FRY said that osteomyelitis of the maxilla might be acute, subacute, or chronic. At the present time the acute type was an uncommon condition. It was one of the rarest things seen in dental practice. Osteomyelitis in dentistry was commonly seen in the lower jaw, but very seldom in the upper jaw. With improved conditions the clinical picture of acute osteomyelitis was disappearing, but in such a place as Singapore, where there was much malnutrition, osteomyelitis was common, though with less mortality as a result of the advent of antibiotics. The reason why the acute stage was more frequently seen in the mandible than in the maxilla was the poor blood-supply of the former, and infection in most cases spread from the teeth. The few cases of acute osteomyelitis of the maxilla seen in adults during the last few years had probably been due to direct infection from an acute antrum or were a secondary condition following a carcinoma of the antrum or its neighbouring structure.

While acute osteomyelitis of the maxilla was rare, chronic local osteomyelitis of the bone was probably the commonest bone infection to be found today. He wondered whether laryngologists really appreciated the close relation of the spongy alveolar bone to the antrum. He raised this question because reference had been made to the dense compact bone which formed the walls of the antrum, and one was left with a slight feeling that because of such compact bone everything was safe. It might be that the surgeon accustomed to doing the Caldwell-Luc operation formed the opinion that the antral wall was of equal density in all regions, except for the inner wall. This was not so. The floor of the antrum which was formed by the alveolar bone, had a very thin layer of compact bone only a little thicker than the wall of the cancellous spaces of the alveolar bone itself. It was similar to that found surrounding the healthy tooth socket, which was nothing more than the wall of the cancellous spaces spread out in a line and was seen under X-rays as a white line known as the lamina dura.

Microscopic findings in normal maxillae showed that the bony floor of the

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antrum was not always continuous. It was not only pierced by vessels, but sometimes showed broad interruptions so that the periodontal membrane of the neighbouring teeth came directly in contact with the mucosa of the antrum. Further, there was an intimate relationship between the blood-vessels supplying the teeth and their periodontal membrane and the antral mucosa.

This brought him to the very important point as to whether they fully appreciated the importance of dental sepsis. He was a conservative in most respects but not when infected teeth were concerned. He would suggest that laryngologists who had patients on their waiting-list should see that tooth infection was eradicated before the patient was admitted for treatment.

The PRESIDENT said that he would like to assure Sir William Kelsey Fry that the laryngologists were very conscious of the danger of which he had spoken and he need have no qualms in that respect.

MR. D. S. HAYTON-WILLIAMS: We have heard Mr. Macbeth give a very full account of osteomyelitis of the maxilla. He has intentionally left me some loopholes in order to mention various dental facets of the condition. And no doubt when I have finished speaking I will have left many more loopholes —only in my case unintentionally.

As to the cause, the authorities differ as to that most frequently, some favouring it being secondary to antral infection while others feel that odontogenic infection is the commonest cause. Yet another cause, however, is from an infected cyst and particularly the cyst which has already been inadequately treated, when barriers to spread of infection have been broken down. Happily not common except in war-time is the gunshot and shell fragment wound, which owing to the comminution and infection of bone and investing tissues, can produce the condition. As to the cause in sucklings there is general agreement as to the infection coming from the mother's breast or feeding bottle. But I must say I have often wondered where the precise entry and track of infection are.

At this stage I would like to emphasize the differentiation between an acute dental alveolar abscess and an acute osteomyelitis. True, one may simulate the other or even lead to the other. But whereas the extraction of the tooth will produce a dramatic local and general improvement within 24 hours in the dental alveolar abscess, there will be much less improvement or even none when *only* such treatment is carried out for osteomyelitis. One cannot lay down a set of rules and figures to distinguish one from the other and only clinical experience will permit differentiation. The closed eye and red indurated cheek may be due to a *periostitis* from an acute dental alveolar abscess or be due to an *osteomyelitis* from an infected tooth.

I think we can agree, however, that the early and plentiful and continuing dosage of antibiotics at the earliest opportunity is essential in both these conditions, whether or not surgery is indicated. The condition can be such a serious one that I feel there is a temptation to be radical in operating whereas I am sure that both immediately and eventually a conservative approach is the better. We are, of course, much helped by our antibiotics. As Kurt Thoma says: " Careful extraction of a loose tooth can be more effective and no more

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Fig. A.

A ragged, irregular, ill-defined cavity in the bone of the premaxilla at the midline.

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FIG. B.
Rarefaction over the apex of the offending tooth.

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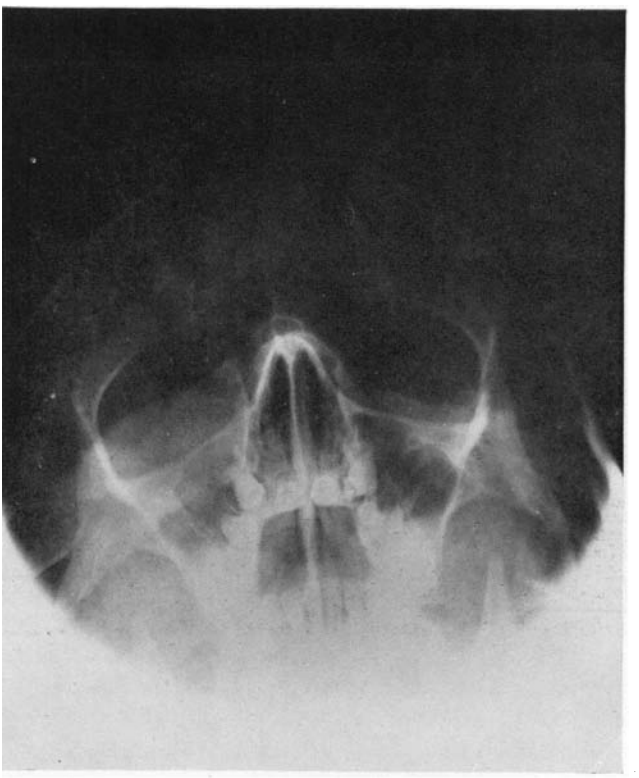


FIG. C.

Impaired translucency of the right antrum ; poor definition of the wall of the maxillary sinus. The appearances suggest that the maxilla is involved in an inflammatory process.

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traumatic than an incision." And in the case of children it is worth recalling that the jaw is full of buds of developing teeth which it would be both tragic and useless to disturb. Resistant as these tooth-buds are to infection it may still happen that they succumb in the course of the disease ; but it is better to await their sequestration and exfoliation.

Apart from the points I have already made there are two main lines of treatment in which the dental surgeon can help later :

1. In the fabrication and fitting of a prosthesis for missing portions of maxilla and teeth.
2. In orthodontic observation and treatment of children.

It is in these cases that conservative treatment will pay the handsomest dividends from the preservation of the tooth buds, since it is the preservation of the teeth which provides the stimulus for the growing alveolus and the concomitant pleasing facial contour.

Mr. Macbeth has already shown a series of slides enlarging on his lecture and there would be no point in my going over similar ground. I would, however, like to show the slides of just two cases, both relevant to the remarks I have made.

H.B., aged 62, had had a discharge in the upper incisor region for twenty years following tooth extraction. In 1944 at another hospital he had the sinus "curetted", following which he had intermittent swelling of the upper lip. In January, 1949, I saw him in hospital with a very swollen lip which, however, was less swollen than on the previous day, I was told. X-rays were taken (Slide A). The X-ray here shows a ragged, irregular, ill-defined cavity in the bone of the premaxilla at the midline. In a few days I operated, making an alveolar crest incision from canine to canine regions, turned up a muco-periosteal flap and removed a lot of fibrous granulation tissue and small sequestra. A flavine emulsion gauze pack collapsing the flap on to the base of the cavity completed the operation. This was probably a case of a midline developmental cyst originally inadequately treated. There has been no recurrence.

F.R., a little girl aged 8 years. The general medical practitioner wrote that about three weeks previously the child had had pain and swelling of the right cheek and tenderness of the right upper deciduous canine. She was given sulphadiazine for a week and improved considerably. In another five days, however, swelling and pain recurred with a temperature of 101°F. She was admitted to hospital with induration, œdema and tenderness below the right eye. X-rays were taken (Slide B). There is rarefaction over the apex of the offending tooth which is not entirely due to the overlying follicle of the developing permanent canine. (Slide C.) The X-ray report reads: " Impaired translucency of the right antrum. Poor definition of the wall of the maxillary sinus. The appearances suggest that the maxilla is involved in an inflammatory process ". The deciduous canine was removed under general anæsthesia, penicillin administered for five days and recovery was uneventful.

MR. E. D. D. DAVIS said that osteomyelitis of the maxilla in the infant was rare. Brown Kelly, in 1905, collected only 17 reported cases. He, himself,

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had seen only five and these were all before or about the time of the First World War. It was universally accepted that this type of osteomyelitis commenced in the tooth follicle; it very rarely, if ever, started in the antrum.

A section through the nose and mouth of the full-term fœtus shown was one of a series of about fifty prepared by Mr. Gavin Livingstone at the Ferens Institute. It showed the relation of the tooth follicle to the nose and antrum and it indicated how the infection spread. If suppuration was present a crucial incision down to the bone with a sharp knife should be made. The incision was made from the palate across the alveolus high up into the cheek sulcus and the second incision along the alveolus should be adequate. If a loose tooth was found it should be removed. A gauze drain or packing was unnecessary and undesirable. If free drainage had been obtained by an adequate incision there would be no need to incise the cheek at the infra-orbital margin. He had had no experience of penicillin, but children did not tolerate sulphonamides well.

An anatomical specimen of the floor of the antrum and alveolus of an adult was shown.

It had been estimated that 20 per cent. of cases of suppuration of the antrum were of dental origin. There was an area of soft cancellous bone in the anterior angle between the facial and antro-nasal walls of the antrum which was vulnerable to osteomyelitis. He had seen two cases, both adults, which arose from an alveolar abscess of the lateral incisor and canine. Brown Kelly saw two cases of dental origin. He had seen two cases and knew of others of osteomyelitis which followed operations for the drainage of suppuration of the antrum. The first was a Caldwell-Luc operation, the patient was a debilitated young woman and he used, unfortunately, the now out-of-date Heath's coarse-cut conical burr to open the antrum. The unnecessary and severe trauma was a contributory cause of the osteomyelitis. The second was a young man who had had an earlier operation for severe antral suppuration and a second operation to establish free drainage. Scraping and vigorous burring with the removal of the muco-periosteum, a radical operation involving bone done too soon in the acute stage, and packing a sinus with gauze were all contributory causes of osteomyelitis.

The above cases occurred before the advent of penicillin and the antibiotics. Antibiotics had considerably reduced the number of cases.

Mr. Donald Watson showed a photograph of a woman who had an osteomyelitis of the right upper jaw 26 years ago. He operated on her when she was a few months old. When he operated a lot of primary tooth buds fell out. She recovered and a picture of her when she was 22 years of age showed a certain asymmetry of the face, the right side not having developed as well as the left. She had no primary dentition and what she now had was her second dentition, in which the only tooth missing was the right incisor. None of the molars were missing at all.

He had seen five of these osteomyelitis cases of the upper jaw—two in children and three in adults. One child died, and the other child and two of the adults lived. The last one he had to deal with was in 1942. This was a girl 18 years old suffering from polypi in the nose, and which her doctor was in

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the habit of removing, giving her at the same time sulphonamide as a precaution; she became insensitive to the sulphonamide. He carried out an intranasal operation. She had a marked osteitis in the naso-antral wall and she developed osteomyelitis of the upper jaw. The sulpha drugs were of no use whatsoever and after a long and tedious illness she died. He discussed this case with the late Mr. Patterson who had a lot of experience of these bone operations, and he told him that there was one thing which he had not done and which he (Mr. Patterson) would have done, namely, to attack the inner canthus of the eye, removing the ascending process of the maxilla, and this procedure would have blocked the drainage to the cribriform plate and the meninges. This was the dangerous area.

Mr. R. L. FLETT reported a case of chronic osteomyelitis of the maxilla in a woman who had had pain in that region for about 18 months. Certain teeth had been removed and the dental surgeon reported that they seemed to be very loose. The woman was sent to him to decide whether she had any infection in the antrum. The bone was soft and he thought there was some infection in it. He came down on granulations and sandy sequestra which Mr. Hayton-Williams had mentioned and, solely by curettage, he got away all this material. There was no bone left in the maxilla until one got up to the supra-orbital foramen. By the time he had finished, the antrum, which he had not opened, was standing out like a sac in the cavity.

MR. C. A. HUTCHINSON said that recently he had had referred to him by the Plastic Unit a young man in the early twenties, who had originally had a tooth loosened by a blow on the left lower jaw, necessitating its removal. A series of sequestra then developed in the left mandible necessitating several operations ending in hemi-mandibulectomy. When he eventually came up with a view to reconstruction of the mandible a good deal of left-sided facial œdema was noticed, and the patient was referred to the speaker.

On examination the left external auditory meatus was found to be completely obstructed by swelling. Questioning revealed that from infancy there had been intermittent left otorrhœa. Radiograms were taken and showed a chronic infected mastoid. At mastoidectomy chronic osteomyelitis was found extending as far as the upper limit of the squama and involving the whole of the mastoid region, while the tympanic plate had been completely destroyed. He had removed everything he possibly could, insufflated copious penicillin-sulphathiazole powder and packed the wound, securing first-intention healing.

The patient was about to be returned to the Plastic Unit when he suddenly complained of acute pain in the left cheek and within 24 hours the left nasal passage was obstructed. There was enormous brawny œdema of the left cheek and region of the inner canthus, and he had obviously developed an acute osteomyelitis of the left maxilla. Heroic doses of intramuscular penicillin were given and he was glad to say that the condition had now completely cleared up and the Plastic Unit were again considering the question of reconstruction of the mandible.

In the speaker's opinion the infected mastoid had been, in this case, the

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source from which blood-borne spread had determined infection of both the left mandible and later the left maxilla.

MR. R. D. OWEN asked whether it was not time that the intranasal operation was on its way out, as far as adults were concerned. Osteomyelitis following the Caldwell-Luc operation was a very rare occurrence. If an antrum did not dry up after repeated washouts, one would suspect the mucosal changes to be irreversible. The ideal treatment for such cases was a Caldwell-Luc operation. The problem with regard to children was another matter, and the intranasal operation had its part to play.

MR. A. MACKENZIE ROSS said that he had recently seen a case in which there was prominent swelling in the inner canthus of the eye. The eye surgeons did all they could for it, but the condition did not subside. It proved to be a case of osteomyelitis of the maxilla, which made a very satisfactory recovery under streptomycin and incision over the maxilla. He had a tremendous respect for dental surgeons—and he always referred to them cases which had been referred to him in order to make sure that the teeth were sound. He wondered whether Sir William Kelsey Fry at heart approved of the Caldwell-Luc operation. At what age should that operation be performed ?

MR. GAVIN YOUNG said that Sir William Kelsey Fry would be realizing by now one of the principal reasons why the dental surgeons so seldom saw acute osteomyelitis of the maxilla. It was because dental surgeons never used that " infernal instrument " the rasp. He himself had never used it, but he had seen cases following the use of the rasp. The same applied to its use in the intranasal frontal operation.

MR. R. G. MACBETH, in reply, said that he thought Sir William Kelsey Fry had put his finger on an important point, namely, that there was no general appreciation of the fact that the antrum was in contact with compact bone everywhere but on the floor, where spongy bone alone was to be found. Even here was a clue as to why osteomyelitis so rarely occurred as a spontaneous secondary infection to antritis.

Another point which appeared to have emerged from this discussion was the universal condemnation of the use of the burr and the rasp in relation to spongy bone. Mr. Owen had asked whether it was not time that the intranasal operation was discarded in favour of the Caldwell-Luc, and the speaker agreed emphatically. With regard to Mr. Layton's suggestion that the infection in infants could be nasal in origin, no doubt the answer was that it could be, but on the other hand there was so often a history that the mother's breast was infected and that the organism was the same in the two cases. Also one found that so often in these babies the nasal discharge, if present at all, was subsequent in time to the swelling. So there seemed no reason to make an exception in babies to the general principle that the bony disease was so rarely secondary to antritis. Mr. Simson Hall had asked if there was a place in surgery for osteomyelitis of the upper jaw, and other members had quoted cases. There seemed to be such a place in cases where the antibiotics had not

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succeeded and where sequestra had not separated. It seemed very evident that where there was a localized infection, one must be prepared, as in the case of the frontal bone, to make limited removals from time to time.

SIR WILLIAM KELSEY FRY, also in reply, said that as he was not an E.N.T. specialist, he could not express an opinion on the Caldwell-Luc operation. He added that dry socket was very uncommon in the upper jaw and very common in the lower.

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