Surgical emphysema during dental treatment

SIR,—Further to Dr J H B Williams's letter (8 October, p 960) and request for further information, his interesting case is not unprecedented. Indeed, one wonders how many cases, possibly of a minor degree, go unreported, with the use of compressed air as a power source for dental instruments having become a more common practice. Norton and I described a case seen in 1966 in an article—"Surgical Emphysema Occurring During Conservative Dental Surgery."¹ My 54-year-old psychiatric inpatient received dental treatment and developed definite emphysema due to entry of air around the gingival crevice while that part of the preparation was carried out which involved grinding of tooth substance below the level of the gum margin. It was reported that spectacularly, within fifteen seconds, the lower left eyelid slowly swelled up to such an extent as to close the patient's eye, with the swelling extending over the left side of the face and neck, and superficial crepitus being easily elicited. She complained of fullness in her throat on swallowing, but there was no dyspnoea, pain, or tissue discoloration. Possibilities such as an underlying allergic reaction or partial angioneurotic oedema were rapidly excluded in view of the likely precipitating cause, and the x-ray confirmation of unilateral emphysema demonstrated over the left side of the face and neck, extending from the level of the lobe of the ear down to the level of C6. There was no evidence of mediastinal extension. The patient, being reassured by continued close supervision, having minimal discomfort, and possibly being quietly gratified at being the centre of interest, showed no exacerbation of her neurotic tendencies, but was calmly co-operative. The condition settled down gradually and completely over a period of five days: antibiotics were held in reserve but not given as at no time was there any evidence of infection.

Interestingly, the literature extends back to 1900, with Turnbull describing a case of dental surgical emphysema, the patient being a Naval bugler who pumped air into his facial tissues after the extraction of a bicuspid.² Other authors have reported similar occurrences after oral surgery associated, respectively, with nose-blowing, coughing, and spitting.³⁻⁵

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- ¹ Segal, M., and Norton, H D, *Dental Practitioner*, 1967, 17, No 8, 274.
- ² Turnbull, A A, *British Medical Journal*, 1900, 1, 1131.
- ³ Stockdale, C R, *Oral Surgery*, 1958, 11, 135.
- ⁴ Brown, C J, jun, *Journal of the Kansas State Dental Association*, 1950, 34, 94.
- ⁵ Oswalt, T G, *Journal of the Mississippi Dental Association*, 1963, 19, 12.

SIR,—Dr J H B Williams (8 October, p 960) reports a case of surgical emphysema following dental treatment. Although uncommon, this is not a rare event,¹ and has been described following a variety of dental procedures, including especially the use of compressed air in an air turbine dental drill or in a syringe.² Further cases have been recorded after the use of hydrogen peroxide to irrigate root canals,^{3,4} and we have seen a case that resulted from trumpet playing immediately following a dental extraction. The condition usually resolves spontaneously with no serious con-

sequences^{1,5} but may in exceptional circumstances extend to the mediastinum,⁶ or cause air embolism.⁷

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- ¹ Shovelton, D S, *British Dental Journal*, 1957, 102, 105.
- ² Feinstone, T, *Journal of the American Dental Association*, 1971, 83, 1309.
- ³ Bhat, K S, *Oral Surgery, Oral Medicine and Oral Pathology*, 1974, 38, 305.
- ⁴ Walker, J E G, *British Journal of Oral Surgery*, 1975, 13, 98.
- ⁵ Killey, H C, and Kay, L W, *The Prevention of Complications in the Dental Surgery*, p 56. Edinburgh and London, Livingstone, 1969.
- ⁶ Lloyd, R E, *British Dental Journal*, 1975, 138, 393.
- ⁷ Rickles, N H, and Joshi, B A, *Journal of the American Dental Association*, 1963, 67, 397.

SIR,—Further to Dr J H B Williams's letter (8 October, p 960), the production of surgical emphysema following the introduction of compressed air to the tissues during dental practice is, I regret, no new hazard. Each year many of my oral surgical colleagues will see such cases referred for management from dental practitioners. At this hospital three such cases have been seen and treated in the last three weeks. This, of course, does not include the facial and neck surgical emphysema that follows injudicious nose blowing after zygomatic complex and other mid-third facial injuries.

The accompanying photographs clearly show the significant extension of air within the tissues of two patients following the application of a dental compressed air syringe to the upper labial sulcus (fig 1) and to the root canal of an upper tooth (fig 2). This was done ostensibly to dry an operative site. Perforation of bone adjacent to root apices allows air escape to the facial tissues. The onset of swelling is dramatic, painful, and frightening, occurring within a second or two.

The significance of the event is the almost routine entrapment of air within the periorbital tissues and this is often accompanied by ptosis and diplopia. The air can be shown on a standard occipitomentaral radiograph as relative orbital radiolucency. Extension to the sub-mandibular and lateral pharyngeal spaces also occurs, and indeed this happened in the patient shown in fig 1. The clinical presence of

crepitus over the anterior triangle, supra-scapular region, and sternomastoid areas is dependent on the duration of the exposure and the pressure of the syringe air.

Most compressors for dental use provide air in the region of between 2.5 and 5.6 kg/cm², and this may be reduced or not at the practitioner's discretion; thus the facility for introducing air is considerable.

The correct management of the problem as mentioned by Dr Williams is based on the awareness that where air has reached, so could have oral pathogens and commensals, in addition to organisms from the air line. Prophylactic antibiotic cover is thus fully justified, especially where the emphysema has reached the upper mediastinum. Absorption of the entrapped air continues in severe cases over a 7-10 day period and the patients' diplopia and ptosis reduce spontaneously over this time.

Dental surgeons are discouraged from applying compressed air syringes intimately to the teeth or soft tissue, but accidental surgical emphysema is occasionally seen.

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*.*This correspondence is now closed.—ED,
BMJ.

Evolution of poliovirus since introduction of attenuated vaccine

SIR,—Dr H V Wyatt's letter (20 August, p 518) highlights the difficulty of providing surveillance of a vaccination programme over a period in which the limitations of the techniques for distinguishing wild from vaccine strain of poliovirus have become apparent. Indeed, one of my main reasons for publishing the data was to point out that strains with "vaccine-like" characters in the marker tests were being isolated before any artificially attenuated viruses were released into the community.

Dr Wyatt's calculations of the number of cases of poliomyelitis are based on a misunder-

standing of the reporting systems involved. On the one hand there are the cases of "paralytic poliomyelitis" notified by the clinicians to the Department of Health and Social Security.¹ There may or may not be virus isolates from these patients. Secondly, there are the weekly reports of the virus isolates from diagnostic laboratories.² The clinical information submitted with these *Communicable Disease Reports* is necessarily preliminary and the subsequent course of the illness frequently causes revision of the diagnosis. This is verified by the Epidemiological Research Laboratory when these reports are correlated with the official notifications for the annual poliomyelitis surveillance report. The correct figure obtained in this way is included in the annual report of the Department of Health and Social Security and represents the best estimate of the prevalence of poliomyelitis in the community as a whole.

In 1965-8 there were 110 cases and in 1969-72 only 23. Dr Wyatt's larger figure of 39 cases for 1969-72 was obtained by adding the unverified communicable disease reports and overestimates the true position. When these factors are taken into account it is obvious that strains were available from roughly half of the paralysed patients in each period (51/110 and 11/23, respectively) and that my category of "neurological disease" included all the paralytic cases. There are, of course, many defects in a study which depends on an informal arrangement for collection of strains, but it would be very expensive to set up a large prospective study of the question. Moreover, there are no figures available from the pre-vaccine era for comparison. I would certainly prefer to see available resources devoted to the promotion of polio vaccination.

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¹ Miller, D L, Reid, D, and Diamond, J R, *Public Health (London)*, 1970, **84**, 265.

² Public Health Laboratory Services, *Communicable Disease Reports* 1969-72.

Polyunsaturated fatty acids in multiple sclerosis

SIR,—The article by Dr D Bates and colleagues (8 October, p 932) contains an elementary error that may mislead the casual reader. In their trial one group "received eight capsules daily for Naudicelle oil (Bio-Oils Research Limited). Each capsule contained 0.6 ml of oil, giving 360 mg of linolenic acid and 3.42 g of linoleic acid daily. . . linolenic acid . . . is the parent acid of the long-chain polyunsaturated fatty acid docosahexaenoic acid." Naudicelle capsules contain, I understand, oil extracted from the seeds of evening primrose (*Oenothera biennis* or *lamarkiana*), and this oil contains about 70% of linoleic acid (octadeca-9,12-dienoic acid or C18:2n-6) and 7% of γ -linolenic acid (octadeca-6,9,12-trienoic acid or C18:3n-6). The body cannot convert γ -linolenic acid into docosahexaenoic acid (C22:6n-3), which it forms from α -linolenic acid (octadeca-9,12,15-trienoic acid or C18:3n-3); this is the predominant fatty acid in most leaves but is not present in significant amounts in the seeds of the evening primrose.

In the nomenclature used above C18 means that the compound has eighteen carbon atoms; :3 means that it has three double bonds; and n-6 means that the first double bond is between the sixth and seventh carbon

atoms, counting from the methyl end. The two classes of essential fatty acids (EFA, conveniently designated vitamins F₁ and F₂) belong to the n-6 and n-3 groups:

Vitamins F₁: C18:2n-6 (linoleic) →
C18:3n-6 (γ -linolenic) →
C20:3n-6 (dihomo- γ -linolenic) →
C20:4n-6 (arachidonic);
Vitamins F₂: C18:3n-3 (α -linolenic) . . . >
C20:5n-3 (timnodonic) . . . >
C22:6n-3 (clupanodonic).

Arachidonic, timnodonic, and clupanodonic acids are important constituents of myelin. The last two are relatively abundant in marine oils. Fish-eating people, such as Eskimos and Faroes islanders, do not get multiple sclerosis; thus the error of Dr Bates and his colleagues is the more important, since they have not in fact tried the therapeutic effect of a precursor of clupanodonic acid, and this might be much more worthy of trial.

A further reason for avoiding elementary chemical errors concerns another isomer of α -linolenic acid—namely, α -elaeostearic acid (octadeca-9,11,13-trienoic). Whereas the linolenic (n-3) class of EFA is very effective in lowering plasma cholesterol, elaeostearic acid powerfully raises it. In fact the only dietary fatty acids that lower plasma cholesterol are EFAs of the linoleic and linolenic classes (vitamins F₁ and F₂), and not just any PUFA.

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*.*Professor Sinclair sent a copy of his letter to Dr Bates and his colleagues, whose reply is printed below.—Ed, *BMJ*.

SIR,—We are grateful to Professor Sinclair, who was the first to suggest that a deficiency of polyunsaturated fatty acids might be a factor in the aetiology of multiple sclerosis, for pointing out the error in our paper and for putting the biochemical record straight.

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Preoperative anaesthetic visit

SIR,—The problem of preoperative anxiety has been investigated by several authors,¹⁻⁴ but no one has been able to offer an easy solution. Part of the answer may be the booklet described by Dr Julian M Leigh and others (15 October, p 987), but it is not the only answer. I suspect that the whole issue centres around the time available to spend with the patient when a large work load means that little time is left at the end of the day; perhaps in this situation the initial patient contact and assessment should be at an outpatient anaesthetic clinic. There is no doubt that the patient gains useful information at the preoperative visit and it may offer the surgeon an additional safeguard for a small number of patients who do not understand the nature of their impending operation.⁴ Quimby⁵ has stressed the importance of the preoperative visit but suggests that there is a danger that statements

may assume more significance than in normal circumstances.

It is also important to consider the anaesthetist as more than a soother of troubled brows: he is also a clinician. The main function of the preoperative visit is to assess the preparation and fitness of the patient for anaesthesia and surgery. Dr Leigh and his colleagues mention that 10 minutes was available to see their patients and that no patient was examined clinically. Surely this is wrong. It means that the surgeon can no longer expect the help and support of his anaesthetic colleagues in preoperative (and postoperative) assessment. The value of the preoperative visit is something each anaesthetist must decide for himself, but I feel the trend away from such visits should be firmly resisted.

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¹ Egbert, L D, et al, *Journal of the American Medical Association*, 1963, **185**, 553.

² Wilson, W E, *Anesthesia and Analgesia: Current Researches*, 1969, **48**, 605.

³ Ramsey, M A E, *Anaesthesia*, 1972, **27**, 396.

⁴ Ryan, D W, *British Journal of Clinical Practice*, 1975, **29**, 3.

⁵ Quimby, C W, *Anesthesia and Analgesia: Current Researches*, 1969, **48**, 695.

SIR,—All anaesthetists should be grateful to Dr J M Leigh and his colleagues for the scientific evaluation of the preoperative anaesthetic visit (15 October, p 987). The provision of a booklet and a visit by an anaesthetic nurse are undoubtedly of some value to the patient; but I do not think there is any substitute for a visit by the anaesthetist who will be anaesthetising the patient or will, at least, be present when the patient is anaesthetised.

On arrival in the anaesthetic room the patient sees a friendly doctor with whom he has been chatting the previous day, and who, he knows, has a full knowledge of his condition. The anaesthetist, on the other hand, has acquired a knowledge of the patient's medical history, his physical capabilities and defects, the results of investigations, the vulnerable incisor crown, the drugs the patient has been taking, etc. Can all this information be acquired in a brief survey of the notes in the anaesthetic room? I am convinced that a preoperative visit by the anaesthetist is not aiming at perfection but is an essential part of the anaesthetic procedure. It should be omitted only in exceptional circumstances.

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SIR,—The paper by Dr Julian M Leigh and others (15 October, p 987) concerning the efficacy of preoperative visits in reducing patients' anxiety raises important statistical points to which your readers may like to be alerted.

The authors assessed initial anxiety levels in three groups of patients. Subsequently patients in group A were visited by "a representative of the anaesthetist," patients in group B were provided with a booklet containing essentially the same information as given to group A, and the patients of group C constituted a control group who received neither visit nor booklet. Anxiety was then assessed a second time before the patients came to surgery. There were no significant differences