CONDITIONS AFFECTING GENERAL ANAESTHESIA IN THE DENTAL OFFICE

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IN VANCOUVER there are at least nine busy oral surgeons carrying on most of their practice in their office space, with a large volume of the work being done under general anaesthesia. There is one surgical clinic to which many dental surgeons go by appointment. Several hospitals have outdoor surgical services which accept dental patients. Children's Hospital admits about ten patients per week for multiple fillings. All hospitals in the city admit patients for dental surgery when indicated for medical reasons. Every dental surgeon one meets, who has not made permanent and satisfactory arrangements, says he has many patients who could and would benefit from safely administered general anaesthesia. The demand, by both patients and surgeons, has increased greatly over the past decade. Some progress has been made, but many dental surgeons find it impossible to arrange reliable coverage, so that they refuse to become involved at all. I understand that a large Medical-Dental co-operative in one of our large Eastern cities is finding it difficult to staff its proposed operating suite with anaesthetists, so the problem is not just a local one.

Why is general anaesthesia not more widely offered to the dental patient as an elective procedure? Is it because it must be offered outside of hospitals? The suggestion was made a short while ago, by a well-intentioned, but I think ill-informed, high official in the British Columbia Dental Association that all patients requiring general anaesthesia should be admitted to hospital. In his small home town, hospital beds are in excess of normal surgical needs, and dental patients can be admitted in small numbers.

The Vancouver General Hospital operates an outdoor surgical service on which we book five cases per day, four days of each week, for general anaesthesia. Competition for these spaces on the operating list is brisk, and each of our dental surgeons could fill all of the available spaces in any one week. Neighbouring hospitals are trying to establish outdoor facilities for dental patients but little is being accomplished. Our own service would need to be expanded nearly twenty times to handle the necessary dental surgery and at the same time meet the normal demands of surgical slates.

Admission of patients to hospital, *per se*, does not guarantee patient safety. The Attorney General of British Columbia gathered a list of 30 operating room deaths over a period of five years recently. Nine deaths occurred during elective nose and throat surgery (4 tonsillectomies and 4 dental extractions)—in operating rooms—by definition, according to some, places of safety for the surgical patient.

Hospital routines being what they are, the flow of patients in most hospitals is

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distressingly slow. Recently a dental colleague and myself finished four full mouth extractions in his office by 3 00 p m (having begun at 1 00 p m). We proceeded across the block to the hospital operating room, and by 5 15 p m had completed a fifth full mouth extraction. All five cases were straightforward "routine" cases, but the one done in hospital took over four times as long because of "hospital delays." No one individual was responsible for the delay, but it did take over two hours to do one case.

I think I have made my point that hospitalization is not *my* answer to dental surgery under general anaesthesia.

Why are anaesthetists not enthusiastic about administering general anaesthesia in other than operating rooms—and specifically in dental offices? The training of most anaesthetists today tends to make them wholly desirous of the protected environment. You can rationalize this attitude by "safety," "comfort," "legal protection," "safety in numbers," "proper equipment," but I claim that the training of the modern anaesthetist in most cases leaves him without the necessary skill, appreciation, or enthusiasm for office anaesthesia. Coupled with an abhorrence of pioneering in our field, this lack of training results in a frightened, insecure, self-excusing, ineffective anaesthetist when a request is made for an anaesthetic away from his home base—the operating room! This is somewhat understandable when you recall that many dentists have not been taught modern approaches to general anaesthesia, and frequently attempt to dictate techniques and pharmacology, and refuse to supply equipment in sufficient depth to allay the anaesthetists's worries, the while insisting on "doing the case" which has just had a "small sandwich and a cup of tea." Especially does our anaesthetist fear the widespread publicity attendant upon a "death in a dental chair."

I propose to discuss a basis for office anaesthesia which I truly believe answers all of the objections which can be raised against this type of practice. I may sound rather bigoted, but, I feel that this is an area where compromise in any detail can mean death—a preventable death—and therefore an all the more undesirable death.

PERSONNEL—THE OPERATING TEAM

The most important man is the surgeon. He has to have a group of patients requiring or requesting general anaesthesia for major oral procedures in sufficient number to make an occasional booking in the operating room unsatisfactory to his needs. The surgeon must appreciate that his anaesthetist must be carefully chosen, that he will be required to allow all decisions about the patient's anaesthetic care to be made by the anaesthetist, and must be interested primarily in a long series of happy patients without complications.

The anaesthetist must be more than merely adequate in the handling of oral surgical problems. Intubation must be an incident not an adventure. He must have enough arrows in his quiver that when one misses the mark, either slightly or completely, he is not found wanting, but can quickly and neatly extricate himself from whatever situation is arising before, not after, it becomes a crisis. He must know his field well enough that he does not fear to cancel the case which should be cancelled, or to request admission to hospital for the patient who needs it! He

must be sufficiently interested in this special aspect of his field to bring to it enthusiasm for the special finesse which makes a case 100 per cent successful instead of 98 per cent. The dental office is no place for a novice nor is it an easy place to "pick up a fee." The chair assistant and the recovery supervisor must have been well indoctrinated, so that they fall into the habits of handling patients to the anaesthetist's satisfaction. These people can make life either miserable or contented.

EQUIPMENT

Any standard gas machine, in tip-top repair, and with which the anaesthetist is completely familiar, will function well. Although I am completely at home with draw-over demand flow machines, I do prefer for office work a conventional circle filter absorber, for reasons which will be apparent later. Gas in quantities to ensure complete safety is needed. We have large tanks piped to operating room machines and to recovery room walls, and small tanks are held in reserve on the machine. Good suction must be available in surgery and recovery room. There is no excuse for sloppy maintenance, i.e., adhesive tape patching of bags, exhausted rubber, makeshift connections. Provision must be made for adequate supply of autoclaved needles and syringes, and it may even be that disposables are better. Endotracheal tubes for nasal and oral intubation must be ready in sufficient variety of size and length to avoid embarrassment.

Regardless of the duration of surgery these cases are major anaesthetic problems, since the anaesthetist and surgeon are sharing the airway. Therefore, intubation of the trachea is a *sine qua non*. In any case where difficulty with maintenance of the airway arises, I feel that failing to have an endotracheal tube in place would cause the doctrine of *res ipsa loquitur* to apply. Oral or nasal intubation may be selected. Our surgeon has recently suggested that the oral tube is easier to place and that it causes very slight trouble to him in his work. Most oral surgeons will appreciate a nasotracheal tube. One special complication is very easily neglected. The nasal tube may end up in the right main bronchus—with the patient in the chair, it is especially important that this be immediately diagnosed and corrected. We have found that when the patient has been told that his throat may have a tickle for 24 hours, as a result of the placing of the tube, but that this has been done to ensure his airway and his safety, then no objection is raised. Similarly, when told of the muscle pains which may occur following succinylcholine, the patient accepts this with good grace. The fore-warning, though, is important.

SELECTION OF PATIENTS

Most of the patients requiring oral surgery are healthy in all respects except for their immediate problem. However, I would be the last to suggest that there are not absolute indications for hospital admission. These include cardiac, cerebral, or pulmonary disease, diabetes which is difficult to control, myasthenia, haemophilia, severe hypertension, anaemia, plethora, and patients with diseases under treatment with adrenal corticoids.

History and physical examination should be complete enough to elicit information about these and other contraindications to outdoor status

Temporary exclusions would be recently ingested food (5 hours) and upper respiratory infections. Pregnancy is not a contraindication to office anaesthesia, but I feel the woman's obstetrician should be aware of, and approve of, the surgery. The aged, very young, infirm, or crippled should not be accepted because of difficulties arising when they come to leave the office. Obese and large patients will present difficulty in transport within the office.

The patient, or his responsible guardian, signs a consent for surgery as well as a consent for a general anaesthetic before premedication is given. This consent specifically allows the surgeon in person to do oral surgery and authorizes a member of our partnership (who is not specifically named) to administer a general anaesthetic. After surgery is completed, the patient must be accompanied to his place of residence by a friend. Public transport, or driving his own car, is definitely proscribed.

PREMEDICATION

Premedication is not omitted but is very light. Usually meperidine 25 mg. and atropine 0.4 mg. are given $\frac{1}{2}$ to $\frac{3}{4}$ hour preoperatively.

OPERATIVE SCOPE

The average full mouth extraction, including alveolectomy and trimming of the gum lines, followed by thorough haemostatic suturing, lasts just over half an hour. However, if difficulty is encountered, we are perfectly happy to continue until the surgeon has finished his task to his satisfaction. Other surgery may include extraction of impacted teeth, dental cysts, and any common oral surgery.

PHARMACOLOGY AND TECHNIQUES

Our office, like most dental offices, is not engineered to preclude the accumulation of static electricity. The use of the dental drill also is a source of ignition. Therefore we require an absolutely non-flammable technique throughout.

Induction agents are either thiopentone or methohexital. We are not wholly converted to methohexital, but are trying at present to evaluate it.

Succinylcholine is used in small doses to facilitate intubation with a cuffed tube.

Maintenance of anaesthesia is with halothane, in a partial rebreathing, carbon dioxide absorption technique, using a 2-litre flow of oxygen. Demand flow systems give erratic vaporization patterns, and I feel they are best avoided.

The technique outlined effects great drug economy, and the high oxygen content avoids postoperative spasm and cyanosis. Levels of anaesthesia are kept as light as possible.

Chloroform, trichloroethylene, and fluoromar have all been tried and in our hands gave a high incidence of nausea and some vomiting, both of which are very rare with our present routine.

The patients are checked for history of physical state on first arrival. Our surgeon is a physician as well as a dentist, so he accepts responsibility for

these preliminaries, but any problems are solved after consultation with the anaesthetist. We never hesitate to send a patient home or to hospital if this seems indicated. Consent having been signed, premedication is ordered and given. Female patients undress to undergarments and wear a gown. Male patients wear trousers and a gown into the operating chair. Watches, dentures, and detachable bridges are removed for safekeeping. A blood pressure cuff is placed on every patient and blood pressure is checked frequently. Induction is carried out with chair tilted well back. Thereafter the chair is adjusted to surgical requirements, as long as the pressure stays satisfactory. We have seen no hypotension to worry about. In fact, pressure and pulse rate are usually slightly elevated, owing to the light levels of anaesthesia. At the conclusion of the surgery, the pack, placed to aid in the oral toilet, is removed and the mouth thoroughly suctioned. The chair is flattened out and the tube removed. The patient, when the anaesthetist is happy, is rolled out of the chair onto a stretcher, which serves both as transport and recovery couch.

RECOVERY SUPERVISION

The patient is not put onto the stretcher until he is breathing quietly after extubation. Spasm is rare indeed, probably because of the good haemostasis and the reservoir of oxygen, and cyanosis is never a feature. There is oxygen available in the recovery room, but it is hardly ever necessary to use it. The adjoining walls of surgery and recovery room are of glass and the anaesthetist can observe the previous patients while working at the chair. We have four couches available for recovery, but with a little luck and application of general principles the first patient is usually on his way home before the third patient is out of the chair. Retching is unusual and vomiting quite infrequent. Indeed, over the past four years, in nearly 3500 cases, complications have been singularly rare.

The problems which have given rise to anxious moments include the following:

- 1 One patient was intubated per oesophagus and this was not recognized by the relatively junior anaesthetist. Extubation removed the airway obstruction.

- 2 One anaesthetist provoked a serious nasal haemorrhage. In conjunction with more than usual bleeding during the surgery this required a lot of suctioning, which gave the patient quite an epiglottitis, and almost gave rise to the issuing of a writ!

- 3 One extreme case of hypotension occurred with halothane overdosage in a patient who had been questioned about, but denied, any cardiac history. He was later found to have had an episode suggestive of a coronary attack. He recovered completely and was allowed to proceed home in normal fashion.

- 4 Some mild hypotensive episodes have been the result of over-vigorous exhibition of halothane.

- 5 Some years ago we did have a case of phlebitis of an arm vein in a patient susceptible to phlebitis of leg veins. This patient had been heavily premedicated because of extreme nervousness and required several injections (coramine being one).

- 6 In spite of rigid exclusion of upper respiratory infection, one patient did develop a postoperative bronchopneumonia, which cleared rapidly.

- 7 On occasion, where intubation gives difficulty for mechanical reasons, it is a

proof of maturity to back off and allow the patient to recover from the anaesthetic. He who runs away can come back another day!

CONCLUSIONS

We feel that the following conclusions are valid

1 If the otherwise well-trained anaesthetist fails to go out from his cozy operating room and meet the challenge of office dentistry, the field is left by default to either the poorly trained physician, or the dentist who may be tempted to essay surgery and anaesthesia simultaneously. This we do not condone. In either case, the patient is poorly served, and anaesthesia slips back, not forward.

2 If we, the well-trained people in our field, avoid contact with the oral surgeon and his needs in his office, who then is available to teach the proper and modern approach to the dental student in training, and indeed to the adolescent anaesthetist?

3 Anaesthesia for dental surgery entails an airway shared by surgeon and anaesthetist. This means endotracheal anaesthesia.

4 Oral surgery can be accomplished safely and comfortably for all concerned under general anaesthesia in the proper office environment. This environment includes a surgeon who appreciates in full the anaesthetist's problems, an anaesthetist who is completely competent and enthusiastic, and equipment and office organization specially tailored to the task at hand.

To insist on admitting these patients to hospital is not practical.

To deny the comfort of general anaesthesia is unnecessarily cautious and indeed cruel.

RESUMÉ

Si l'anesthésiste, par ailleurs bien qualifié, ne fait pas l'effort de quitter sa confortable salle d'opération pour pénétrer dans le bureau du dentiste, ce champ d'action demeure ouvert ou au médecin peu préparé, ou au dentiste qui peut être tenté de pratiquer simultanément la chirurgie et l'anesthésie. Nous ne pouvons permettre cela. Dans l'une ou l'autre éventualité, le malade est mal servi, et l'anesthésie recule au lieu d'avancer.

Si nous, qui sommes à la hauteur de la tâche, évitons de faire face au chirurgien-dentiste et à ses besoins, dans son bureau, qui alors pourra préparer convenablement la voie à l'étudiant en chirurgie dentaire, et au futur anesthésiste?

L'anesthésie en chirurgie dentaire, comporte le partage des voies aériennes supérieures et par le chirurgien et par l'anesthésiste. Ceci suppose l'anesthésie intratrachéale.

La chirurgie dentaire peut être pratiquée avec sécurité et confort sous anesthésie générale dans un bureau convenablement organisé. Ce milieu comprend un chirurgien pleinement conscient des problèmes de l'anesthésiste, un anesthésiste compétent et enthousiaste, et un local bien organisé en vue du travail à accomplir: matériel, espace, etc.

Il n'est pas pratique de faire admettre ces malades à l'hôpital.

Refuser les avantages de l'anesthésie générale est une prudence inutile et, à la vérité, une cruauté.