PETHIDINE AND GALLAMINE ALONE IN THE TREATMENT OF FRACTURED MANDIBLE

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USUAL ANAESTHETIC TECHNIQUE

The usually recognized technique of anaesthesia for reduction of a fractured mandible involves nasal intubation (Boyd and MacLennan, 1952), and in war injuries, which are usually of a more complicated nature, this is essential (Roche, 1945).

While realizing the safety of such a technique, I feel that it still has definite disadvantages and risks, which are given below:

Passage of a nasal tube. This can cause bleeding, particularly if the anaesthetist is unskilled. Should this bleeding be excessive, it can run down into the stomach and may possibly cause postoperative vomiting (Hewer, 1953). As the postoperative end-result will be a tightly closed mouth; there is no oral "escape route" should the nasal one prove too difficult.

Technical difficulties in nasal intubation. Two techniques are recognized:

(i) Direct vision—using laryngoscope and Magill forceps. This can be extremely difficult. If acrylic splints are already in position, the oral access may be minimal, and they must not be displaced. Furthermore, possible narrowing of the angle of the mandibular body or its displacement backwards can increase intubation difficulties.

(ii) Blind nasal intubation. Prior to the relaxants this was the method of choice for most anaesthetists. Today there can be few who are experts in this technique, and James’ view (1950) is surely shared by many. Inexpert blind intubation is more likely to lead to both nasal bleeding and even more severe trauma (Coffin, 1950; Brown, 1952).

Cranmer (1955) suggests a technique of blind intubation using thiopentone and suxamethonium. This surely needs practice, and in many parts of the world the human skill is just lacking.

Postoperative vomiting. Apart from vomiting of blood that has run down into the stomach, this is more likely following a general anaesthetic than after an non-anaesthetic technique. Hypoxia (Clement, 1951) will further increase this hazard (e.g. occurring during a difficult intubation). Vomiting occurring in a patient in whom the mandible has been securely fixed to the maxilla must be considered as very dangerous—even where there is perfect postoperative attention and the necessary wire cutter to hand.

Although not dangerous, postoperative retching can disturb the result.

From the above-mentioned complications it may be concluded that general anaesthesia in such cases is not always ideal. Correct local analgesia can some-
times be very difficult and relaxation is often unsatisfactory.

NEW APPROACH TO THE PROBLEM

In June 1954 I had to anaesthetize a man with a fractured mandible, and attempted direct vision nasal intubation, but could only pass a No. 5 Magill tube through either nostril. This caused moderate haemorrhage and I felt that this tube was too small for the maintenance of anaesthesia—even for a short period. The operation was postponed, and this experience led me to develop the following technique.

The requirements for reduction of a fractured mandible are (in common with many procedures):

(i) Adequate relief from pain, i.e. analgesia.

(ii) Muscular relaxation.

The principle was to use morphine and pethidine for the former effect and gallamine triethiodide (Flaxedil) for the latter—but NO anaesthetic.

I have used this technique five times on four male patients, aged 19 to 41 years. The dates were June, July, October, and December 1954. I fear that it would take too long to get an adequate series, so have felt justified in communicating the idea so that others with greater access to these cases can possibly try it out—and improve further on it.

Technique.

It should be noted that each case led to some alteration in technique—thus only the method in the last case is described.

Premedication. Morphine 1/6 to 1/4 grain (10 to 15 mg) and atropine 1/100 grain (0.65 mg), one hour before operation. As the patients are unable to swallow during the procedure, a dry mouth is desirable.

Explanation to the patient. This is most important, as it is essential to gain his confidence yet not frighten him. All four patients were placid.

The patients were told that this was not an anaesthetic—but that they would feel sleepy, and that one of the drugs would greatly diminish pain, but that they might still feel the actual reduction of the fracture a little. It was explained that the other injection would cause the jaw, limb and neck muscles to relax. It might affect the breathing, but that if they were uncomfortable there was no danger and that oxygen and the antidote were ready.

It is essential to have an agreed signal about the respiration, as speech is virtually impossible. A suitable system is for the patient to raise one hand if breathing becomes difficult, and the other if he feels that it is very difficult or might stop. It actually did stop in the second case. If in doubt as to the patient's memory, this signal can be written down on paper.

Dosage and administration. An Olovson (commonly known as "Gordh") needle was used. I began by injecting 50 mg pethidine (1 per cent solution) slowly intravenously. After a pause to see if there was any nausea, a further 25 or 50 mg was given—depending on the size of the patient and the effect of the morphine.

An initial dose of 20 mg gallamine was then given, and its effect judged as in normal anaesthetic practice. Further doses of gallamine were given at intervals of 1½ to 2 minutes as follows:

Second dose, 20 mg.

Third dose, 10 mg, and similar subse-
quent doses. 60–80 mg gallamine were required, and after the experience of the second case a “head raising” test was devised, in which the patient was asked to raise his head prior to giving each succeeding dose of gallamine. When he can no longer raise it, relaxation of the jaw should be adequate—and so should the respiration.

More pethidine was given, usually in 25 mg doses as required according to the amount of pain, and a nod or shake of the head can supply the answer to enquiries in the absence of speech. The maximum dose of pethidine used was 200 mg, and it seemed that 150 mg should be adequate for the average male. As with gallamine, there must be a pause before the drug begins to take effect, which is time consuming but essential. In practice these drugs may well be given alternately and the respective effects noted.

Atropine and neostigmine were given in the usual way when the dental surgeon had completed the procedure.

Precautions. It need hardly be said that oxygen, a face-mask and bag, and a syringe already filled with prostig-
mine must be at hand. The Olovson needle is essential if a quick injection of neostigmine is required.

TYPES OF OPERATION
In the first three cases the mandible was wired to the maxilla using acrylic splints. The second case was interesting in that he had a fractured mandible (in three places), maxilla and nose—a difficult intubation problem.

Figure 1 shows the last case; pin fixation was performed. Local was used for the insertion of the pins and the radiological result is shown in figure 2. It is not perfect, but it gives an idea of the amount of work possible with this technique.

RESULTS
These are difficult to assess from so few cases:

(i) From the dental surgeon's viewpoint his operating conditions were quite satisfactory.

(ii) From the patient's viewpoint (four placid men!), it did not seem so bad in practice as one would think from reading the foregoing. My main query was as to the amount of pain felt. Their answer was: "I felt a little—but that was nothing." The last patient—who had the biggest procedure—was operated on on two successive days; he did not seem perturbed at the thought of his second operation.

COMMENTS
I cannot describe this procedure as pleasant—indeed, the entire treatment of fracture of the mandible must be very unpleasant. However, the doses of analgesic drugs used were fairly big and in
practice it "worked", the pain involved being only slight and momentary. Fortunately, fracture patients are, as a rule, co-operative, grateful for their treatment and otherwise fit.

Maybe there are special indications for this technique: (1) Nasal obstruction, polypi and especially a broken nose. (2) Lack of oral access (i.e. a technically difficult intubation). (3) Placid and intelligent patients. (4) Absence of an anaesthetist skilled in intubation. (5) Preference on the part of the dental surgeon (or patient) for "local"—a very marked feature in Sweden, for example.

Apart from these indications—it seems to avoid certain theoretical risks and difficulties. The "standard" technique must, however, be used in many cases of simple and all cases of complicated fractures (war injuries) of the mandible.

The "series" is very limited, only four cases. Owing to lack of opportunity for further trial of the method, the author feels justified in writing up this technique as it seems to have promise, and maybe others with better opportunities may investigate its possibilities.

There must be great room for improvement, especially now that the phenothiazine derivatives are being used in anaesthesia, with their beneficial effect on vomiting and fear. Patients must, however, retain their faculties enough to react to depression of their respiration.

ACKNOWLEDGMENTS

I wish to thank Herr Gunnar Witkowsky, dental surgeon, for his co-operation in developing this technique; also Dr. Erik Evers for his permission to publish the roentgenograms.

REFERENCES