Sedational anaesthesia for laser skin therapy

John HW Ballance

Background

Sedational anaesthesia as practised today has a long history. As long ago as 1959 this technique’s combination of drugs was being used in medicine and later adaptations enabled it to be employed in obstetrics and other areas where a short-term, deep sedation was necessary.\(^1\)

Initial efforts to define the effects produced by this type of anaesthetic gave rise to the terms ‘artificial hibernation’, ‘neurovegetative block’ and ‘ataralgia’. Later, it was called ‘neuroleptanalgesia’, ‘neurolepsis’ or ‘neuroleptanaesthesia’, all of which imply an alteration of sensation and particularly the perception of pain in a drug-induced state.\(^2\)

The technique involves the use of a potent analgesic in combination with a powerful sedative. In practice, the analgesic is an opioid and the sedative is from the butyrophenone family. The drugs used in sedational anaesthesia are titrated to give certain effects. During laser rejuvenation, the pain felt by the patient may be modified by injecting local anaesthetic or topically applied cream, but pain breaking through these may give rise to movement which hampers the work of the operator. Sedational anaesthesia, because of an alteration in the perception of pain, will cause the patient to move less.

The sedative used gives rise to mental detachment, preventing recall and the time taken for the procedure becomes ‘compressed’ in the mind of the patient. Patients questioned afterwards will testify to the shortness of the procedure and will usually remember nothing after the intravenous cannula being inserted.

Nausea and vomiting are almost always absent during sedational anaesthesia by virtue of the direct effect of the sedative used: there is a depression of the chemoreceptor trigger zone in the brain, preventing the vomiting centre from being stimulated.\(^3\) Most anaesthetic agents will depress the reticular-activating system, rendering patients completely unconscious. Sedational anaesthesia does not do this and, although there is some mild depression of
this system, true unconsciousness, with loss of protective reflexes, does not occur.\textsuperscript{4}

\section*{Drug combinations}

In practice, several different combinations of analgesic and sedative have been used. For analgesia, phenoperidine, fentanyl and pentazocine have all been used previously.\textsuperscript{7} The drug pethidine, which was used many years ago in this technique, has now been abandoned because of side effects, principally nausea and vomiting. The author currently uses ketorolac because it is a powerful analgesic agent with very few side effects.

Initial experiments with this technique used, as a sedative, the drugs haloperidol and droperidol but these, although proving successful in the technique itself, were found to be too long-lasting.\textsuperscript{5} This is particularly relevant in laser rejuvenation, when patients require to go home, unsedated, on the day of operation.

Accordingly, diazepam, in its original state and emulsified, in a latter preparation, was introduced into the technique as a short-acting sedative. The arrival of midazolam has revolutionized this and many other techniques. It is a very powerful but relatively short-acting sedative and ideally suited to this type of anaesthesia.\textsuperscript{6}

\section*{Use of sedational anaesthesia in medicine}

In the past, sedational anaesthesia techniques and the drugs used in its practice have been employed in many areas. The analgesic and sedative combination has been thought to have been ideal as a premedication. During some types of neurosurgery and for some diagnostic procedures, where the co-operation of the patient is necessary during the operation, sedational anaesthesia has been employed.\textsuperscript{7} It has also been used as a supplement to a lighter general anaesthetic and to regional anaesthesia, such as spinal or extradural.

In ophthalmic surgery and during the treatment of patients who have been burned, patients are often less than optimally fit. This method of anaesthesia confers considerable advantages over a general anaesthetic because of its lighter nature and because it can be repeated.\textsuperscript{8} During cardiopulmonary bypass and for patients undergoing intensive therapy, sedational anaesthesia may be used as a supplement to other techniques.

With reference to laser rejuvenation, sedational anaesthesia is indicated for several reasons. Many patients prefer to be unaware of the procedure that is being carried out but do not require, or request, a general anaesthetic. Operators undertaking this type of work express a preference for the technique giving, as it does, good pain relief and amnesia for the procedure, which may involve extensive, time-consuming techniques.

\section*{Contraindications}

It is not, however, a technique which is applicable to all patients. Those who are intolerant of the drugs used in the technique, or indeed those who for various reasons are particularly tolerant, may not be suitable. Patients with a potential allergy to one or other of the drugs used in the combination should obviously be excluded, as should patients under 16 years of age because of licensing problems.

Patients with certain untreated medical conditions may have to be excluded and the author has personal experience of a patient who had stopped medication for hyperthyroidism and was almost completely resistant to the anaesthetic technique. Lastly, although the technique is designed not to abolish protective reflexes, it would be wise to avoid patients in whom there was a possibility of the airway becoming incompetent during sedation.

\section*{Technique}

The technique itself is carried out in the following manner. First, a pre-operative questionnaire is sent to the patient, well before the date of surgery. This will hope to elucidate, amongst other details, any particular drug therapy, current medication and problems with previous anaesthesia. There is then a pre-operative consultation, often initially on the telephone, but finally a face-to-face interview in order to discover any acute or chronic problems which may have been missed.

Patients are asked to have only a small amount of light food and drink very early on the day of treatment. Although protective reflexes are maintained and nausea and vomiting is very uncommon, it is wise to take extra care.

An intravenous access is set up usually with an indwelling plastic cannula in the back of the patient’s hand and basic monitoring, usually consisting of pulse oximetry, is initiated. There should be the means for taking the patient’s blood pressure and reading an electrocardiogram, but these need not be running constantly.

An assistant for the anaesthetist is mandatory and this person should be available at all times throughout the procedure. The anaesthetist is also present throughout to monitor vital signs, as well as to maintain the level of sedation. It goes without saying that this physician should be qualified for the task and should not be the person carrying out the procedure.\textsuperscript{9}

The drugs used in the modern technique are: ketorolac up to a total of 30 mg; midazolam to a maximum of 20 mg (most patients require only about 10 mg); and propofol to 200 mg. The last drug, propofol, is an intravenous induction agent used at the beginning of routine anaesthesia. In this instance, it is being used in very small amounts to help maintain the sedation. It is
very short-acting and, in the drug dosage used, has no lasting effect.\textsuperscript{10}

The pulse oximetry used during the procedure should be continued at its conclusion for about 20 min, during which time the patient should not be left alone by the assistant who should observe and reassure. The patient should be ready to leave the clinic after about 1 h of postoperative observation, during which time drinks may be given. It is essential that the assistant is within a short distance of the patient at all times, and a responsible adult must arrive to escort the patient from the clinic.

Although the technique of sedational anaesthesia is relatively light and non-traumatic for the patient, proper facilities must be available in the location where it is practised. As outlined above, there should be a dedicated assistant for the anaesthetist who is also skilled in resuscitation. Facilities for resuscitation must be available and modern equipment at hand. Emergency drugs must also be available and should include epinephrine, atropine, chlorpheniramine, hydrocortisone, aminophylline, with the addition of naloxone to reverse the opioid and flumazenil for the sedative.\textsuperscript{11}

**Drawbacks**

The technique of sedational anaesthesia is relatively trouble-free, but there are certain problems which may arise. Some patients may become over-sedated following an abnormal reaction to the drugs used and it may be necessary to use reversal agents to counteract this. Fortunately, this is rare. The opposite problem, that of undersedation, may also arise in patients that are relatively tolerant of the drugs used. Also, reaction to the individual drugs may occur, although with proper preoperative questioning this is also very rare.

The one remaining problem is of loss of control. Many patients fear that they will lose control when under general anaesthetic and this is extended, in some, to include sedational anaesthesia. It may be necessary to reassure patients that the level can be adjusted to either lighter or deeper according to a patient’s reaction and the procedure being used.

**Conclusion**

Sedational anaesthesia is gaining popularity for more and more procedures. With correct supervision and proper administration, it is a safe procedure which can be used for many techniques. It is well suited to extensive laser rejuvenation.

To summarize, sedational anaesthesia is a combination of sedation and analgesia to make the operator’s work easier and possibly more thorough, with good amnesia and pain relief for the patient.

**References**
