

Hypnosedation : A Valuable Alternative to Traditional Anaesthetic Techniques

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Abstract. Hypnosis has become routine practice in our plastic and endocrine surgery services. Revivication of pleasant life experiences has served as the hypnotic substratum in a series of over 1650 patients since 1992. In retrospective studies, followed by randomised prospective studies, we have confirmed the usefulness of hypnosedation (hypnosis in combination with conscious IV sedation) and local anaesthesia as a valuable alternative to traditional anaesthetic techniques.

The credibility of hypnotic techniques and their acceptance by the scientific community will depend on independently — confirmed and reproducible criteria of assessing the hypnotic state. Based on the clinical success of this technique, we were interested in confirming this phenomenon in healthy volunteers. The revivication of pleasant life experiences thus served as the cornerstone of a basic research program developed to objectify the neurophysiological attributes of the hypnotic state. We compared hypnosis to normal alertness with similar thought content. In our experience, the activation profile obtained during the hypnotic state was completely different from simple re-memoriation of the same subject matter during normal alertness. This represents an objective and independent criteria by which to assess the hypnotic state.

Introduction

This paper is a review of our clinical experience with hypnosis as adjunct to conscious sedation and surgery performed under local anaesthesia. This anaesthetic technique, called hypnosedation, was used in more than 1650 patients and is based on close collaboration between surgeons and anaesthesiologists. Working conditions change : the operating theatre is calm, the patient is conscious but distracted during surgery, and surgical manipulations must be gentle and precise. The anaesthesiologist closely follows the operation in order to anticipate the patient's needs.

We propose that active participation in surgery may hasten recovery by giving the patient a sense of control.

History of hypnosis

The history of hypnosis has no clearly defined beginning. It is known that hypnosis has been practised in one form or another for thousands of years. The scientific history of hypnosis has had a stormy course. Franz Anton MESMER (8) is credited with being the father of medical hypnosis. Sir John ELLIOTSON (1), Professor of Surgery in London made an initial report

of surgical procedures performed using "mesmerism anaesthesia". Although ELLIOTSON was severely criticised, other surgeons adopted those techniques. Parker, in Dublin, reported 200 procedures, including a painless amputation (7). Subsequently, in 1852, a Scottish surgeon, J. ESDAILE (2) published in detail 345 major operations performed in India with "Mesmerism" as the sole anaesthetic. He showed that this technique minimised surgical shock and improved mortality. His mortality rate of 5 percent was remarkable, since the usual rate with major surgery at that time was approximately 40 percent. At this time, this promising surgical approach was censured principally because the medical establishment showed a great deal of hostility towards the technique. In fact the discovery of chloroform in 1831, nitrous oxide inhalation in 1844, and the anaesthetic properties of ether in 1846 (9) eliminated interest in the psychological mechanisms of pain and in the patient's resources as a factor influencing recovery.

From the controversial reports of its use in surgery prior to the development of chemo-anaesthesia to the extensive experimental and clinical literature on its use during the past 50 years, hypnosis has been observed to provide anxiety and pain relief and enhanced recovery.

Hypnosis : a definition

Laboratory research in the area of hypnosis has been organised around two competing paradigms : special process and sociocognitive perspectives. Special process accounts revolve around the traditional notion that hypnotic behaviour differs fundamentally from ordinary social behaviour, and reflects the operation of non-ordinary states of consciousness and unusual psychological mechanisms (6).

Alternatively, sociocognitive accounts emphasise the continuity between hypnotic and non hypnotic responding, reject the positing of unusual psychological processes, and attempt to account for hypnotic behaviour by using social behaviour (e.g. role playing) (14).

These theoretical controversies have been much less prominent in the clinical literature. Regardless of whether it is theorised to be a special state of consciousness, the clinical literature simply assumes that the term "hypnosis" refers to a specific psychological state or condition, and can be reliably induced through the use of rituals known as hypnotic induction procedures. Once induced, the "hypnotic state" can be readily recognised and in some way facilitates a therapeutic outcome. Hypnosis may be considered as that state or condition which occurs when appropriate suggestions elicit distortions of perceptions, memory or mood. The ability to experience suggested distortions varies considerably among individuals, but is not the same as compliance conformity, gullibility or persuasibility. While investigators agree that the subject's ability to respond to suggestion is crucial, it is also clear that this responsiveness may readily be inhibited if the subject wishes to do so. Therefore, the establishment of a trusting relationship and the clarification of the limitations and goals for which hypnosis is to be used are essential to create the co-operative relationship in which responsiveness to suggestions is maximised.

The hypnotic state is a naturally occurring state characterised by aroused, attentive, focused concentration accompanied by relative constriction of peripheral awareness. Other important aspects of this experience include a kind of parallel awareness in which information may be processed at different levels of consciousness (6), the ability to alter perceptions, and the occurrence of an alert, altered state of awareness with physical relaxation. Hypnosis, despite the Greek root of its name, is not sleep. Individuals in a hypnotic state are alert and aroused, and EEG studies demonstrate patterns that are inconsistent with sleep (10). Individuals in a hypnotic state show a tendency to suspend critical judgement and to compulsively comply with instructions given them, a phenomenon that has been termed "suggestibility". However, even highly "hypnotisable" individuals in a hypnotic state are fully capable of deciding not to comply with an instruction and to

arouse themselves from this state spontaneously. Another common misconception regarding hypnosis is that only weak or sick people can use this technique. Current evidence indicates that, if anything, the opposite is true. The mentally healthy individual is more likely to enter into the hypnotic state (15). This means that a population of medical and surgical patients is likely to be more able to use hypnosis than a population of psychiatric patients.

Considering the growing profusion of pharmacological treatments and technical devices, why should the busy clinician bother with hypnosis ?

What does it add to what we already know about care of surgical patients ? What about long-held suspicions regarding hypnosis and hypnotic procedures both within and outside the profession ?

There are two answers to these questions. On a practical level we face increasing pressure to provide brief, treatment that is effective in dealing with symptoms but that permit the patient to recover rapidly and give him autonomy. Any approach that can combine the potential for brief treatment with that of teaching patients to carry on independently with treatment deserves attention. Secondly, the kinds of problems encountered by surgical patients (anxiety - stress - pain - fear of losing control) often occur at the complex interface between mind and body ; hypnosis is of special interest since it is itself a fascinating mind/body phenomenon. During hypnosis, verbal instructions may stimulate physical changes such as analgesia, muscle relaxation, changes in blood flow or skin temperature. The benefits of hypnosis for pain control can be derived from a number of factors alone or in combination (14).

- 1) Specific reductions in perceived pain and suffering in hypnotically responsive individuals.
- 2) Reduced suffering due to non-specific, placebo effects on relaxation and anxiety.
- 3) Modulation of pain receptors through suggestions which involve distraction and other cognitive strategies.

Since 1992 we have used hypnosis routinely as an adjunct to slight conscious sedation to perform surgery under local anaesthesia. We started this technique in the plastic surgery department as the surgeons routinely used local anaesthesia and the patients were interested in avoiding general anaesthesia. These generally healthy patients undergoing elective surgery were interested in minimising their anaesthetic risk, and actively contributing to their own recovery. More than 1200 procedures were performed with this technique.

Due to this overwhelmingly positive experience in 1994, we proposed the technique to patients undergoing endocrine surgery (parathyroidectomies, thyroidectomies, mammary adenomectomies), which had hitherto been performed under general anaesthesia.

We found that these patients displayed the same motivation in avoiding general anaesthesia regardless of their underlying medical condition, as those undergoing elective plastic surgery. An ongoing series of 450 cases has been equally successful in this patient population.

Patients selection

Patients seen at our plastic surgery department or endocrine surgery clinic were given information by the surgeon concerning the possibility of performing the indicated surgery under local anaesthesia combined with a special anaesthetic technique called hypnosedation consisting of hypnosis and slight conscious intravenous sedation.

They were asked to consider this option as an alternative to general anaesthesia (a pharmacological coma).

Deafness, severe psychiatric diseases and allergies to local anaesthetics were considered as exclusion criteria for this procedure. Informed consent was the first requirement for inclusion.

The surgical decision to operate under local anaesthesia and hypnosedation depends on the surgeon's own appreciation of feasibility, and usual routine with the technique. It changes the working conditions: the patient is conscious during surgery and the operating theatre must be calm. There is the necessity for very gentle manipulation, and requires a team effort where anticipation and strong collaboration is the leitmotiv.

Preoperative anaesthetic interview

Patients informed by their surgeon that their intervention may be done under local anaesthesia and hypnosedation, come to the preoperative anaesthetic visit several weeks before surgery.

Information provided during a personal visit by the anaesthetist is effective in reducing preoperative anxiety.

The anaesthetist took a detailed medical history, as for any anaesthetic procedure, (medical/surgical problems — drug consumption — previous surgery) and performed a clinical examination of the patient. Afterwards she asked the patient about his own motivation for this specific anaesthetic technique. She gave a thorough account of the various stages of the anaesthetic/surgical procedure so that the patient knew as much as possible. Information about conscious intravenous sedation and the hypnotic state were given. Furthermore, the visit served to create an atmosphere in which the patient felt free to ask any questions necessary. The visit lasted 30 minutes and took place in a room where the doctor and patient were alone and undisturbed. No "dry run" was proposed. Many

studies have shown that doctor/patient relationships can influence the progress and quality of care. The anaesthetist provide support by showing patients ways in which they might continue to be independent, and as strong and healthy as possible.

During this interview the anaesthetist emphasised to the patient that motivation, collaboration, and team confidence are essential for success. Furthermore the patient knows that he places himself in the hypnotic state and that he will be distracted from surgery but conscious.

Indication for surgical procedures under local anaesthesia and hypnosedation are listed in table I. Most often patients were admitted fasting (-6h) on the morning of the operation. Premedication consisted of 0.25 to 0.5 mg alprazolam (Xanax®, Upjohn).

Table I
Surgical procedures

Minor	Major
Scar corrections	Thyroid lobectomy
Wisdom teeth	Total thyroidectomy
Protruding ears (children)	Cervicotomy for hyperparathyroidism
Septoplasty, reduction of fracture of nose	Breast augmentation
Burn dressing changes	Head — neck lift
Face lift + blepharoplasty	Correction of mammary ptosis
Liposuction	Head — neck cancer with reconstruction
Breast adenomectomy	Septorhinoplasty
Turbinoplasty	Debridement — skin grafting
	Calvarian bone graft (maxillofacial reconstruction)
	Tubal ligation

After transfer to the operating theatre, an intravenous line was inserted and vital signs (heart rate, SpO₂, non invasive blood pressure, and respiratory rate by impedance) were automatically recorded (Datex®, AS3).

Each patient was invited to choose a very pleasant life experience to be relived during surgery. The hypnotic state described to the patient as a "state of mental focalisation on a pleasant life experience" which provides psychological distraction during the operative procedure.

A hypnotic state was then induced using eye fixation, muscle relaxation and permissive and indirect suggestions. The exact words and details of the induction technique and specific suggestions and details during the course of induction varied depending upon the anaesthesiologist's observation of patient behaviour, and on her judgement of the patient's needs. When the patient was thought to be at an adequate trance level (± 10 min.) with slow eye movements, the psy-

chological approach was supplemented by intravenous administration of midazolam and alfentanil to maintain conscious sedation, provide patient comfort and quiet surgical conditions. Criteria for administration of anxiolytic (midazolam, Dormicum® Roche) and analgesic drugs (alfentanil, Ropifen®, Janssen Pharmaceutica) were: verbal and non-verbal patient complaints, changes in vital signs, such as tachypnea, tachycardia and/or hypertension. Local anaesthesia provided by the surgeons was performed \pm 10 min. after initiation of hypnotic state.

Throughout surgery, the anaesthesiologist spoke to the patient with a monotonous voice in metaphorical terms. Midazolam and alfentanil were titrated in order to maintain conscious sedation.

A moderate degree of sensory isolation was necessary to accomplish surgery under hypnosis; this was provided in part by reducing the activity level in the operating room, eliminating unnecessary conversation and by reducing the volume levels of equipment-related alarms. At the end of the operation, the anaesthesiologist (using a normal voice) invites the patient to re-establish contact with the outside world. This serves to restore "normal consciousness" in several seconds.

Postoperative analgesics were given (IV) at the end of surgery and consisted of 2 g of propacetamol (a precursor of paracetamol, Prodafalgan®, Upsamedica) and 100 mg of Rofenid®.

Patients who underwent thyroid or parathyroid surgery remained in the post anaesthesia care unit for 60 min. to allow surveillance of the surgical site for the development of a hematoma.

The other patients were transferred to the ward where oral intake was immediately permitted and oral analgesics (Dafalgan Codein® Upsamedica) were given at the patient's request every 5 hours.

Intraoperative conversion from hypnosis to general anaesthesia occurred in 13 patients out of 1650 (less than 1%). This was due to positional discomfort related to neck hyperextension (3), lack of complete pain relief (3), more complicated surgical procedures (5), or anxiety upon induction of the hypnotic state (2).

There were no deaths in our series and no specific morbidity related to this technique (1 neck re-exploration under general anaesthesia for severe hematoma, after total thyroidectomy for follicular carcinoma under hypnosis, 2 breast re-explorations under hypnosis for hematoma after breast prosthesis, 2 re-explorations under hypnosis after face lift). One case of transient hypoparathyroidism was also observed after total thyroidectomy for toxic multinodular goitre. Patients presented transient recurrent laryngeal nerve palsies and/or Horner's syndrome, due to the proximity of injection of local anaesthetic during surgery.

One patient developed a pneumomediastinum during

a parathyroid adenectomy. The surgical procedure was continued under hypnosis by increasing analgesics and reassuring the patient. No specific oxygenation or ventilation problem occurred in this case.

Clinical investigations

In a retrospective study performed in plastic surgical patients, we found that hypnosis used plastic as an adjunct to conscious sedation was associated with decreased intraoperative requirements for anxiolytic and analgesic drugs (3).

Because of the limits of a retrospective study we carried out a prospective randomised study to compare the effects of conventional stress-reducing strategies (emotional support) and hypnosis as adjunct therapy to conscious intravenous sedation for routine plastic surgery under local anaesthesia.

This prospective study confirms the effectiveness of psychophysiological approaches in the management of acute pain and highlights the therapeutic efficacy of "hypnosis" compared with other stress-reducing strategies. Hypnosis provides more comfort to both the patient and the surgeon, better perioperative pain and anxiety relief, and allows the patient to feel more in control than standard sedation. These benefits were obtained despite a significant reduction in alfentanil and midazolam requirements (4).

In April 1994, this technique of hypnosis as adjunct to local anaesthesia was also proposed for endocrine surgery: partial or total lobectomies and total thyroidectomies and for cervical explorations for hyperparathyroidism. We first compared operative data and postoperative courses to a population of patients operated on for thyroid diseases under general anaesthesia in a retrospective study, where we concluded that hypnosis is a very effective technique for providing relief of intra and postoperative pain in endocrine surgery. This technique results in high patient satisfaction and better surgical convalescence and can be used in most motivated patients and reduces the socio-economic impact of hospitalisation (12). Recently we reviewed our experience with initial bilateral neck exploration under local anaesthesia and hypnosis for primary hyperparathyroidism. This technique can be performed safely, efficiently and cost-effectively under hypnosis, which may therefore be proposed as a new standard of care (13).

A prospective randomised study (40 patients) comparing thyroid lobectomy under local anaesthesia and hypnosis, with thyroid lobectomy under general anaesthesia, was performed in our centre. Results confirmed those of the retrospective study, while stress hormone evaluations and immunological explorations broaden our first observations.

Basic research

Hypnosis has been used as a therapeutic tool throughout mankind's history. Nevertheless its acceptance by the scientific community remains limited. Consequently, the neural correlates of hypnotic state (HS) remain poorly understood. To better understand what happens in patients in the HS during surgery, we decided to explore the brain mechanisms underlying the HS in healthy volunteers by determining the distribution of regional cerebral blood flow (RCBF), taken as an index of local neuronal activity. The group analysis showed that HS is related to the activation of a widespread, mainly left-sided, set of cortical areas involving occipital, parietal, precentral, premotor and ventrolateral prefrontal cortices and a few right sided regions: occipital and anterior angulate cortices.

The pattern of activation during the hypnotic state differs from those induced in normal subjects by simple evocation of autobiographical memories. These results suggest that, in our experimental condition, hypnosis is a particular cerebral waking state where the subject, although seemingly somnolent, experiences a vivid multimodal, coherent, memory-based mental imagery that invades and fills the consciousness (11).

The neural circuits mediating the anti-nociceptive effect of hypnosis remain relatively unexplored. Therefore a second study using positron emission tomography was proposed in 11 volunteers to identify regions of the brain where hypnosis modulates cerebral responses to a painful stimulus.

HS in normal subjects, as induced routinely by us during hypnosedation in patients, dramatically modifies pain processing in the central nervous system.

It leads to a significant decrease in both painful perception and the perceived unpleasantness of stimuli. This modulatory effect is related to anterior cingulate cortex activity which responds to pain differently in hypnosis than in normal resting states (5).

Conclusion

Due to a successful experience comprising more than 1650 cases of surgery performed under hypnosedation and local anaesthesia, we may safely propose this technique as a valuable alternative to standard anaesthetic protocols, in certain surgical procedures.

The major benefit of this technique is to guarantee patient comfort during surgery avoiding pharmacological unconsciousness. The active participation of the patient in optimising their own recovery appears to be a significant factor in the consistent patient satisfaction we have observed in this series.

However, this technique imposes a change in the function and focus of the surgical team. As the patient

remains conscious throughout surgery, previously inconsequential details such as tissue manipulation, OR noise levels, conservation, become paramount. The anaesthesiologist is obliged to follow the surgical procedure and to constantly take into account the patient's physical and psychological needs. It goes without saying that the anaesthesiologist is unable to circulate during the operation. These requirements may represent a considerable change in the working habits of a surgical team, but as there is no longer any doubt regarding an objectifiable neurophysiological basis for the hypnotic state and its acceptance in the scientific community, these logistical problems should be overcome in the patient's interest. The socio-economic implications of this paradigm shift in anaesthetic technique must be taken into consideration; both from patient's point of view (shorter hospitalisation, faster recovery) and the anaesthesiologist's change in workload.

The success of this technique depends upon considerable technical prowess on the part of the surgeon, concentration and commitment of the entire surgical team, and a willingness to change certain established habits in order to benefit the patient.

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