Acta chir belg, 1999, 99, 151-158

Hypnosis with Conscious Sedation instead of General Anaesthesia ? Applications in Cervical Endocrine Surgery

M. Meurisse, T. Defechereux*, E. Hamoir*, S. Maweja*, P. Marchettini*, L. Gollogly*, C. Degauque* J. Joris**, M. E. Faymonville***

Departments of Surgery, Division of Endocrine Surgery*, and of Anaesthesiology and Intensive Care**, University of Liege, Belgium.

Key words. Thyroidectomy ; parathyroidectomy ; hypnosis.

Abstract. Between April 1994 and June 1997, 197 thyroidectomies and 21 cervical explorations for hyperparathyroidism were performed under hypnosedation (HYP) and compared to the operative data and postoperative courses of a closely-matched population (n = 121) of patients operated on under general anaesthesia (GA). Conversion from hypnosis to GA was needed in two cases (1%). All surgeons reported better operating conditions for cervicotomy using HYP. All patients having HYP reported a very pleasant experience and had significantly less postoperative pain while analgesic use was significantly reduced in this group. Hospital stay was also significantly shorter, providing a substantial reduction of the medical care costs. The postoperative convalescence was significantly improved after HYP and full return to social or professional activity was significantly shortened. We conclude that HYP is a very efficient technique providing physiological, psychological and economic benefits to the patient.

Introduction

The development of hypnosis as a scientific endeavour has occurred within the two last centuries. In 1843, Sir John ELLIOTSON, Professor of Surgery and President of the Royal Medical and Surgical Society in London, made an initial report of surgical procedures realised using "Magnetic Anaesthesia" (1). Although ELLIOTSON was severely and publicly criticized, other surgeons adopted those techniques, calling them "mesmerism anaesthesia". PARKER, in Dublin, reported 200 procedures, including a painless amputation carried out under hypnosis (2). Subsequently, in 1852, a Scottisch surgeon by the name of J. ESDAILE, published a manuscript describing in detail 315 major operations performed in India with "Mesmerism" as sole anaesthesic (3). He showed that the use of Mesmerism anaesthesia minimized surgical shock and improved morbidity. At the 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 ether in 1846 and chloroform in 1847 all but eliminated interest in the psychological mechanisms of pain and in the patient's personality as a factor influencing recovery. Nevertheless, many investigators including psychoanalysts, psychiatrists, and neurophysiologists, continued to study hypnotic phenomena, finally concluding that it was appropriate to define hypnosis as an altered state of awareness (2). It became clear that this state could influence physiological processes, particularly the functioning of the autonomic nervous system, the release of neuroendocrine hormones, immune function, and the perception of pain (4-9).

Since 1992, we have routinely used hypnosis in more than 1300 procedures in plastic surgery (10-11). Our clinical success and experience with this technique, combined with the current predilection to minimally invasive surgery led us to investigate further. We wanted to test whether hypnosis using active patient collaboration, could be used as an effective adjunct to conscious intravenous sedation ("hypnosedation") for endocrine surgery, as an alternative to general anaesthesia.

Patients and Methods

Patients

Since 1992, hypnosis has been employed as adjunct therapy in conscious sedation for plastic surgery at Sart Tilman University Hospital in Liège, Belgium. After a successful experience of more than 1300 procedures under hypnosedation, we decided, early in 1994, to apply hypnosedation in endocrine cervical surgery (10-13).

On a total of 911 patients seen at our academic endocrine surgery clinic for thyroid and parathyroid diseases between april 1994 and june 1997, 339 were given information concerning hypnosis and conscious intravenous sedation, and were asked to consider this option as an alternative to general anaesthesia. Deafness, severe psychiatric diseases, and allergies to local anaesthetics were considered as exclusion criteria for the procedure. Informed consent was the first requirement for inclusion. Patients averse to seeing or hearing any aspects of the operating room experience were automatically excluded. Two hundred and eighteen patients agreed to hypnosedation (HYP group) and were interviewed, examined, and informed by the anaesthesiologists in charge of the project (M.E.F. and J.J.). No preoperative testing of hypnotic susceptibility was done.

Despite the fact that in the present retrospective study, there was non-random assignment of the patients, we wanted to compare the intra- and post operative courses of the HYP group with those of the 121 remaining patients operated on under general anaesthesia for thyroid and parathyroid diseases during the same period of time (GA group). No significant differences were found between both groups concerning demographic data (sex and age), diagnostic indications for thyroid or parathyroid surgery, or types of surgical procedures.

The HYP group includes 197 thyroidectomies : 153 females (mean (± SD) age : 45 ± 13.2) and 44 males (mean age : 42 ± 12.4), and 21 parathyroidectomies : 16 females (mean age : 63.7 ± 16.7) and 5 males (mean age : 55.7 ± 20.2). Indications for surgery and surgical procedures in the HYP group are respectively listed in Tables I and II. For two patients, definitive histology of a cold nodule revealed follicular carcinoma (intraoperative frozen section was negative). These patients had subsequent completion of thyroidectomy under hypnosedation, according to their request, several days after the primary operation. In the other cases of thyroid cancer, diagnosis was provided preoperatively by fine needle aspiration. Among these patients, one was pregnant and underwent a total thyroidectomy under hypnosedation prior to the 24th week of pregnancy.

All the patients of the GA group were admitted the day prior to surgery. Patients of the HYP group scheduled for surgery in the morning were admitted the day prior to surgery, while those scheduled for surgery in the afternoon were admitted in the morning of the operation. In the HYP group, premedication consisted of only 0.5 mg oral alprazolam (Xanax®, Upjohn) in order to assure effective patient collaboration. Prior to induction of hypnosedation, intravenous access was established, to allow titrated administration of anxiolytics (midazolam, Dormicum®, Roche) and analgesics (alfentanil, Rapifen®, Janssen Pharmaceutica). Doses were titrated throughout surgery in order to maintain conscious sedation, to provide patient comfort and to facilitate quiet surgical conditions. Blood pressure, heart and respiratory rates and arterial oxygen saturation were monitored, using non invasive techniques and automatically recorded perioperatively (Datex® AS/3 monitor, Helsinki, Finland).

Hypnotic induction

Hypnosis was induced using an eye fixation procedure and progressive muscle relaxation, as described by Eriksson *et al.*, (10-12, 14, 15). The anaesthesiologist continually gave permissive and indirect suggestions of well-being to maintain the hypnotic process. The exact words and details of the induction technique and specific suggestions during the course of induction varied depending upon the anaesthesiologist's observations of patient's behaviour, and on their judgement

Table I

Indications for thyroidectomy and parathyroidectomy under hypnosis in 218 consecutive patients

Indications for surgery	Nr of patients	
Thyroid surgery		
Thyroid solitary cold nodule	81	*37.1%*
Multinodular goiter	61	*28.1%*
Solitary toxic adenoma	28	*12.8%*
Plunging compressive goiter	13	*5.9%*
Papillary and follicular carcinoma	7	*3.2%*
Toxic multinodular goiter	5	*2.4%*
Chronic lymphocytic thyroiditis	2	*0.9%*
Parathyroid surgery		
Primary hyperparathyroidism	21	*9.6%*
Total	218	*100%*

Table II

Surgical procedures in 218 consecutive patients operated on under hypnosis for thyroid and parathyroid diseases

Surgical procedures	Nr of patients	
Thyroid surgery		
Nodular excision	10	*4.6%*
Isthmectomy	10	*4.6%*
Complete lobectomy	142	*65.1%*
Total thyroidectomy	33	*15.1%*
Completion of thyroidectomy for secondary diagnosis of cancer	2	*0.9%*
Parathyroid surgery		
Adenomectomy	18	*8.3%*
Subtotal parathyroidectomy	3	*1.4%*
Total	218	*100%*

of the patient's needs. A monotonous voice was used, with intentional use of repetitive metaphoric language. A moderate degree of sensory isolation was necessary to accomplish this, provided in part by reducing the activity level in the operating room, by eliminating unnecessary conversation, and by reducing the volume levels of equipment-related alarms. At the end of the operation, the anaesthesiologist (using a normal speaking voice) invites the patient to re-establish contact with the outside world. This serves to restore a fully conscious state within several seconds.

Surgical procedure

In the HYP group, when the patient was thought to be at an adequate trance level (± 10 min) with slow eye movements, his head was gently hyperextended. The line of a 5 to 6 cm symmetric collar incision, in a natural skin crease, was infiltrated with a mixture of prilocaine 1% with adrenaline (1:200,000) (Citanest Adrenaline® Astra, S.A) and bupivacaine 0.5% (Marcaine® Astra, S.A.). The cranial skin-platysma flap was dissected rostrally to the notch of the thyroid cartilage and maintained by stay sutures. The flap was dissected caudally to the suprasternal notch.

A classical thyroidectomy was then realised, preserving the strap muscles. In cases of lobectomy or total thyroidectomy, systematic visualization of the superior laryngeal nerve and dissection of the recurrent nerve and the parathyroid glands were performed. During cervicotomy for primary hyperparathyroidism, all four glands were explored in a bilateral dissection. Except for the use of local anaesthetic, this is essentially the same technique as routinely used for thyroidectomy and parathyroid exploration under general anaesthesia. During the procedure under hypnosedation, the patient was reminded to mention any discomfort using a prearranged signal (wink, grimace). When required, the operative site was re-infiltrated using the same mixture of local anaesthetics. In both groups, no drains were left in place at the end of the procedure. All the patients of both groups were operated on by the same surgeons (M.M., E.H., T.D.) while hypnosedation was conducted by the same anaesthesiologists (M.E.F. and J.J.)

Postoperative phase

As with general anesthesia, postoperative analgesics consisted in the HYP group, of 2 g of propacetamol IV, (a precursor of paracetamol (Pro-Dafalgan®, Upsamedica : 2 g propacetamol = 1 g paracetamol) and 40 mg IM of tenoxicam (Tilcotil®, Roche S.A.). After a stay (60 minutes for the HYP group and 180 minutes for the GA group) in the post anaesthesia care unit, the patients were transferred to the ward, where 500 mg paracetamol plus 30 mg codeine sulphate (Dafalgan® Codeine, Upsamedica) was given orally at the patient's request every 6 h. In the HYP group, the patient was allowed to ambulate immediately. Oral intake was also permitted. The HYP patient was discharged from the hospital on the morning following surgery, allowing several hours surveillance of the surgical site for the development of a haematoma. Patients of the GA group were discharged 48 to 72 hours after surgery. In both groups, prior to discharge, flexible fiberoptic laryngoscopy and measurement of serum calcium were carried out. Patients of both groups had follow-up visits at the outpatient clinic on day 10 and 30 after surgery, during which the surgical wound was examined and a general evaluation performed.

Method of Evaluation

The following parameters were recorded for each patient of both groups : the duration of the surgical procedure, the weight and size of the specimen, estimated blood loss (noted sponge weights), the incidence and nature of any complications and the duration of hospital stay. In the HYP group, the requirements for local anaesthesia and intravenous sedation were also recorded. Postoperative pain and patient satisfaction were assessed using a 10 cm visual analogue scale (VAS) (0 = no pain at all ; 10 = intractable pain) (16, 17). Operative surgical conditions were also rated by the surgeons on a same VAS scale (0 = poor conditions, 10 = excellent conditions including patient positioning and immobility, muscle relaxation, bleeding, incidence of coughing ...). Ten days postoperatively, the patient's muscular strength was measured using a dynamometer and was compared to the pre-operative values (18). Analgesic consumption was recorded for the first postoperative day. Time before full return to social or professional activity was noted on day 10 and 30. Additional data were obtained by phone when needed.

Statistical Evaluation

Statistical calculations were performed using the SPSS for Windows, release 7.0 software package. Results are expressed as mean ± SD. Student's t test or Mann-Whitney tests were used for continuous data, and the chi-quare test was applied for categorical variables. When the number of observations was small Fischer's exact test for 2 × 2 tables was used. Results were considered to be statistically significant at the 5% critical level ($p < 0.05$).

Results

Intraoperative conversion from hypnosedation to general anaesthesia ; Operative data

Only two (1%) of the 218 patients operated on under hypnosedation required intraoperative conversion to GA.

Table III

Comparative operative data of patients operated on for thyroid and parathyroid diseases under hypnosedation (n = 218) and general anaesthesia (n = 121).

	Groups		
	Hypnosedation (n = 218)	General anaesthesia (n = 121)	*P value*
Operative time (min)	66 ± 22	64 ± 12	*NS*
Operative bleeding (g)	65.7 ± 26.2	68.6 ± 30.2	*NS*
Specimen weight (g)	30.9 ± 28.2	31.5 ± 20.6	*NS*
Permanent recurrent nerve palsy (%)	0.5	0	*NS*
Transient recurrent nerve palsy (%)	1.8	0.8	*NS*
Transient hypoparathyroidism (%)	0.5	1.6	*NS*
Life-threatening haemorrhage (%)	0.5	0	*NS*

This was due to positional discomfort related to neck hyperextension in one patient, and lack of complete pain relief in another. In the remainder, all thyroid procedures were completed as initially planned with equal mean operative time in the two groups (Table III). In addition, no significant differences were noted between the two groups regarding the mean weights of the specimens and operative bleeding, assessed by the weight of the sponges (Table III). All patients suffering from primary hyperparathyroidism were cured either by adenomectomy (21 cases) or by subtotal parathyroidectomies for multiglandular hyperplasia (3 cases).

In the HYP group, the mean dose of local anaesthesic was 41.8 ± 11 ml, of which 30 ml were injected along the incision and into the plane of the strap muscles for raising the subplatysmal flap. Subsequent injections were used, if required, for discomfort. This was occasionally necessary for dissection of the superior pole, while locating the superior laryngeal nerve, and during the section of the isthmus (traction on the trachea). In the same HYP group, the use of intravenous medication was minimal (2.9 ± 1.2 mg of midazolam and 550.3 ± 227.6 µg of alfentanil). All patients remained conscious, in contact with the anaesthesiologist throughout surgery.

Morbidity and Mortality

There were no deaths in our series. In terms of morbidity, the overall incidence of complications was 2.75% in the HYP group versus 2.5% in the GA group (NS) (Table III). Under hypnosedation, one permanent unilateral recurrent laryngeal nerve paralysis was noted after total thyroidectomy for follicular carcinoma. One neck reexploration under general anaesthesia was required for severe haematoma after one case of total thyroidectomy initially carried out under hypnosedation. One case of transient hypoparathyroidism was also observed after total thyroidectomy for toxic multinodular goiter. Four patients presented transient recurrent laryngeal nerve palsy and/or Horner's syndrome, due to the proximity of injection of local anaesthesic solution during surgery. After a brief stay in the postanaesthesia care unit, resolution was complete. Fiberoptic laryngoscopy confirmed normal vocal cord mobility at that time. Complications observed in the GA group consisted essentially of transient hypoparathyroidism in two cases and of transient recurrent laryngeal nerve palsy in one case.

Comparative postoperative data

The comparative postoperative data of patients operated on for thyroid and parathyroid diseases under hypnosedation or general anaesthesia are listed in Table IV. The mean hospital stay, the postoperative pain and analgesic consumption were significantly lower in the HYP group. All patients having hypnosedation reported altered time perception during operation, which most estimated as lasting approximately 15-30 minutes. All had subjectively pleasant experiences, involving recollection of past events, and none regretted the choice of this technique. All those with prior general anaesthetics felt that this modality provided superior comfort. The satisfaction of the patients also scored highly when expressed on a 10 cm visual analogue scale on which 0 represents the worst evaluation and 10 the best. Except for both patients who have experienced a conversion to GA, 215 of the 216 remainders would request the same management again, if necessary. For example, two patients did have, closely following, repeated hypnosedation for completion of a thyroidectomy (definitive histology on a cold nodule having revealed follicular carcinoma after negative operative frozen section).

Surgical conditions

Evaluation by the surgeons of operative conditions, using visual analogue scales, revealed higher satisfaction

Table IV

Comparative postoperative data of patients operated on for thyroid and parathyroid diseases under hypnosedation (n = 218) and general anaesthesia (n = 121)

	Groups		
	Hypnosedation (n = 218)	General anaesthesia (n = 121)	*P value*
Pain on day 1 (VAS, cm)	1.8 ± 1.7	3 ± 1.5	< 0.001
Paracetamol consumption on day 1 (mg)	792 ± 598	1306 ± 530	< 0.001
Muscular force (% preoperative values)	95.2 ± 0.5	89.9 ± 0.4	< 0.001
Patient satisfaction (VAS, cm)	9.3 ± 1.3	6.7 ± 1.8	< 0.001
Hospital stay (hours)	44 ± 15	74 ± 8	< 0.001
Postoperative fatigue on day 10 (VAS, cm)	1.7 ± 2.0	4.06 ± 1.9	< 0.001
Return to normal activity (days)	12 ± 10	33 ± 9	< 0.001

in the HYP group than in GA group (Table IV). The position of the patients was identical in the two groups, whereas infiltration of the site with adrenaline — containing local anaesthetic — possibly reduced bleeding. During the hypnotic trance, the degree of muscle relaxation was similar to that seen with use of muscle relaxants. Traction on the muscles did not appear to cause discomfort, and the heart rate remained stable even during potentially painful manoeuvres. With onset of the hypnotic state, patients appeared immobile, relaxed, with slow roving eye movements intermingled with ocular saccades while a respiratory and heart rate decrease was frequently observed. The patient remained conscious, felt listless but experienced an intense subjective well-being. These changes allow surgery to proceed easily. It was also useful to be able to speak with the patient during some difficult dissections of the recurrent laryngeal nerves. Sudden coughing or movement were exceptional. On the contrary, complete catalepsy and detachment occasionally necessitated reminders to swallow, so as to avoid airway obstruction with accumulated secretions.

Professional and social reinsertion

It is generally assumed by the Belgian Social Security that after conventional thyroid or parathyroid surgery under GA, patients return to work after a four to six week period of convalescence. Indeed, after general anaesthesia, patients often complain of fatigue, decreased vitality, and psychomotor slowing 10 to 12 days postoperatively. Sleep cycles are often disturbed, emotional lability and depression are not uncommon, and concentration and memory are reduced. The "postoperative fatigue syndrome" and surgical convalescence were significantly diminished after hypnosedation : professional activities were accomplished significantly earlier in the HYP group (Table IV). The hand grip test (muscular power) revealed a well preserved strength in the HYP group (Table IV). Full return to social and professional activities was accomplished after 33 ± 9 days in the GA group versus 12 ± 10 days in the HYP group ($p < 0.001$)

Discussion

Hypnosis under many forms has been reported and practised for millennia and, secondarily promoted at the turn of the 19th century by several authors in the clinical arena. The beneficial effects of hypnosis on patients undergoing major surgery have been previously described in clinically and scientifically relevant literature (6, 10, 11, 19-25). However, hypnosis remains included in some complementary medicine techniques that have been slow to gain support among allopathic practitioners. This may be due to its reliance on the co-operation of the patient, a high potential for patient and investigator bias, the lack of appropriate controls and perceived variation in patient sensitivity. These reasons explain why the medical community has been slow to endorse or use these procedures more regularly.

Nevertheless, while each hypnotic technique has limitations, it is difficult to negate the overall beneficial outcomes that have been widely reported. The details of particular techniques have been extensively reviewed in a statistical meta-analysis of 34 controlled-outcome studies conducted by MUMFORD (23). More recent reviews have concluded that preoperative hypnosis can significantly shorten the convalescent period, promote physical recovery, aid the emotional response of patients following surgery and demonstrate dramatic cost savings (6, 19, 21, 26, 27). Most recent prospective, randomized, controlled studies have definitively confirmed that the combination of current medical practices with complementary techniques (i.e. hypnosis) results

in both medical and psychological benefits to patients (11, 28).

In our experience, hypnosis has been used in the pre- and postoperative period, but its greatest value is in intraoperative use as an alternative to general anaesthesia (10-13). Due to excellent results in the use of hypnosedation in plastic surgery, and in the current propensity toward minimally invasive surgery, we considered applying the same strategy in cervical endocrine surgery as a possible means of improving the cost/benefit ratio of these procedures which are usually performed under general anaesthesia.

A possible objection is that thyroid and parathyroid surgery can also be performed under pure local anaesthesia as widely practiced prior to 1929 (29). Nevertheless, if this were truly a satisfactory technique, one would expect it to be widely applied. It is clear that currently, for the vast majority of surgeons and anaesthesiologists working in this field, general anaesthesia remains the primary choice in their daily practice. By contrast, since we began the hypnosedation programme in our center, most of patients are systematically asked to consider this option. In our centre, requests for the procedure increase yearly, as the confidence of the general population and medical community increases. Lo Gerfo's team (30) described a series of patients in whom loco-regional anaesthesia and sedation were successfully employed during thyroid and parathyroid surgery. A deep bilateral cervical plexus block, combined with local anaesthesia and intraoperative low dose midazolam permitted curative surgery in all cases. Nevertheless, in comparison with this technique, hypnosedation has the advantages both of avoiding the complications associated with regional anaesthesia (intra-arterial injection, phrenic nerve infiltration) and providing a well-demonstrated reduction in peri-operative pain and anxiety (11). A prospective randomized study we conducted during plastic surgery procedures and published elsewhere, clearly demonstrated this superiority of hypnosedation over nonhypnotic local anaesthesia with intravenous sedation (11). Vital signs are significantly stabilized during hypnosedation, even with reduced doses of alfentanil and midazolam. Hypnosedation thus maximizes the satisfaction of the patient and the surgical conditions.

Our current retrospective study demonstrates the feasibility of performing major endocrine surgery using hypnosedation. We did not assess hypnotizability and outcome, but assumed, as does Barber (31), that all patients were responsive to hypnosis if properly approached. Intraoperative conversion to general anaesthesia was necessary in two cases only (1%). No major morbidity was seen in either group. Surgery under hypnosis did not require longer operative times than under general anaesthesia and therefore did not disturb the schedule of daily operative programmes. On the contrary, at the end of the surgery, re-emergence of the patient takes just a few moments, rapidly freeing the operating room for the next case. For the surgeon, particularly dry operative field allowed an easy dissection. Four factors may have influenced this observation : 1) the necessity for very gentle manipulation, 2) the use of local anaesthetic solutions containing epinephrine, 3) the presence of spontaneous ventilation which avoided periodic increases in intrathoracic pressure with consequent venous hypertension, and 4) the maintenance of improved vasomotor stability during hypnosis (32, 33).

The intensity of pain experienced by the patient and analgesic requirements are subjective parameters and are not proportional to the intensity of tissue damage (34). Psychological influences and prior personal and/or family experiences are very important in the pain phenomenon. Erikson insisted on the fact that pain is not a simple nociceptive stimulus, but rather a complex construct involving memories of past painful experiences, the current episode amplified by the perceived possibility of future pain (15). The hypnotic process, with suggestions of reinterpretation, substitution, distortion, displacement, and even of abolition of pain perception allows the patient (who is deeply focused on reliving a highly pleasant personal experience) to dissociate himself from his or her real, consensus, surroundings (9, 15, 34). It is interesting to note that the suggestion of pleasant experiences is more efficacious in producing hypnoanalgesia than the suggestion of perception of a lesser degree of pain (35, 36). The patient, with adequate hypnotic guidance, relives a comfortable experience ; these sensations of comfort can, in turn, be projected into the present and serve to re-orient the interpretation of the nociceptive stimuli associated with the operation. During surgery, if pharmacological analgesia is required, the total dose is reduced in the patient under hypnosis (11). The doses of midazolam and alfentanil used in our series are minimal. The pain experienced by the patients in the hypnosedation group, in the immediate postoperative period, and the first 24 hours postoperatively, was significantly less than that of patients having had general anaesthesia. Curiously, the hypnoanalgesic effect lasts considerably longer than the operation itself, because decreased analgesic consumption in the hypnosedation group persisted postoperatively.

Despite demonstrating (in volunteers), that the hypnotic state is a particular cerebral waking state during which an apparently somnolent subject experiences a vivid, multimodal, coherent memory-based mental imagery invading and filling the subject's consciousness (37), there is no psycho-physiological explanations for the analgesic effect of hypnosis. Potential hypotheses include modulation of the emotional responses triggered by recognition of nociceptive information according to

the meanings assigned to it, activation of various nuclei in the reticular system with analgesic effects, blockade of transmission of nociceptive information between the reticular system, sensory neurons, and cortical associative neurons, and secretion of endorphins (38). The high level of satisfaction noted in the hypnosedation group is probably related to a considerable elevation of the pain threshold and to a more pleasant subjective experience, particularly when compared to previous surgical hospitalizations. It is also due in part to increased self esteem because of the active, cooperative role played by the patient. It should be noted that "Ericksonian" hypnosis is not directive, which differentiates it from hypersuggestibility. Indirect hypnosis does not rely on execution of suggestions, but rather on accompanying a motivated and consenting patient, who exerts a perceptual effort defined only by his way of seeing the world (10). It is one of the reasons explaining why the most important contraindications to hypnosedation include an insufficiently motivated team (surgeon, anaesthesiologist, nurses) and patient.

Inconsistencies and contradictions remain when one examines the effect of psychological interventions on physiological and biochemical outcomes of surgery (39). Are catecholamines, which respond to emotional state, involved ? Is cortisol secretion potentiated by psychic and physical stresses ? Does presurgically anxiety affect immunologic systems ? These questions, not yet consistently answered, reveal a vast new field of investigation, with possible contributions from widely varying researchers and clinicians. Psycho-neuro endocrino-immunology should be seen as a highly interdisciplinary field, from which answers concerning the mind-body relation may well emerge and help to draw psychology and biology beyond the barriers formed by their respective bodies of knowledge.

In conclusion, from our recent experience in hypnosedation applied to cervical endocrine surgery, we consider that this innovative approach is currently very safe, beneficial and probably the most cost-effective procedure for neck exploration. Given the interest and the expertise of the anaesthetist, and the willing participation of the patient, this is an excellent tool that may have much wider applications than currently appreciated. There are as yet no complications or drawbacks associated with hynosis and the advantages are numerous :

1. hypnosedation may be recommended for routine use in *all patients*, not only for elderly medically compromised patients but also for all those who are fit for general anaesthesia (40) ;
2. there is *no need* for a preoperative determination of susceptibility to hypnosedation ; the *only* condition required is the patient's agreement and cooperation ;
3. major surgical procedures (total thyroidectomy, ...) can be easily performed ;
4. the surgical conditions are considered as excellent, requiring a short operative time with minimal blood loss ;
5. patients' and surgeons' satisfaction are very high ;
6. hypnosedation provides excellent perioperative pain and anxiety relief with minimal requirements for local anaesthesia and intravenous sedation
7. hypnosedation reduces the incidence of side-effects associated with general anaesthesia and allows a rapid postoperative recovery ;
8. the socio-economical impacts are obvious (very short hospital stay, very low requirements for analgesics and no need for expensive anaesthetic agents, early full return to activity ...).

Considering these results, we conclude that hypnosedation can be successfully proposed to a majority of patients scheduled for cervicotomy, regardless of the indication or the exact procedure proposed (41).

References

1. Elliotson J. Numerous cases of surgical interventions without pain in the mesmeric state. 1843 *Lea and Blanchard (Eds)*, Philadelphia.
2. Hoareau J. Les racines historiques. "Hypnose Clinique", 1992, *Masson Eds*, Paris, 3-10.
3. Esdaile J. Mesmerism in India and its practical application in surgery and medicine. 1846. In : Longmans, Brown, Green and Longmans (Eds.), London.
4. Anderson E. Preoperative preparation for cardiac surgery facilitates recovery, reduces psychological distress, and reduces the incident of postoperative hypertension. *J Consult Clin Psychol*, 1987, 55 : 513-520.
5. Blacher R. Brief psychotherapeutic intervention on the surgical patient, 1987. In : R. Blacher (Ed.). *The psychological experience of surgery*. New York, Wiley, 207-220.
6. Blankfield R. Suggestion, relaxation and hypnosis as adjuncts in the care of surgery patients : a review of the literature. *Am J Clin Hypn*, 1991, 33 : 172-186.
7. Hathaway D. Effect of preoperative instructions on postoperative outcomes : a meta analysis. *Int J Clin Exp Hypn*, 1986, 35 : 269-275.
8. Holden-Lund C. Effects of relaxation with guided imagery on surgical stress and wound healing. *Res Nurs Health*, 1988, 3 : 235-244.
9. Spanos N. P., Mc Neil C., Gwynn M. I., Stam H. J. Effects of suggestion and distraction on reported pain in subjects high and low on hypnotic susceptibility. *J Abnorm Psychol*, 1984, 93 : 277-284.
10. Faymonville M. E., Fissette J., Mambourg P. H., Roediger L., Joris J., Lamy M. Hypnosis as adjunct therapy in conscious sedation for plastic surgery. *Reg Anesth*, 1995, 20 : 145-151.
11. Faymonville M. E., Mambourg P. H., Joris J., Vrijens B., Fissette J., Albert A., Lamy M. Psychological approaches during conscious sedation. Hypnosis versus stress reducing strategies : a prospective randomized study. *Pain*, 1997, 73 : 361-7.
12. Faymonville M. E., Fissette J., Mambourg P. H., Delchambre A., Lamy M. Hypnose, hypnosedation : conceptions actuelles et leurs applications en chirurgie plastique. *Rev Med Liege*, 1994, 44 : 13-21.
13. Meurisse M., Faymonville M. E., Defechereux T., Nguyen

DANG D., JORIS J., HAMOIR E. Chirurgie thyroïdienne et parathyroïdienne sous hypnose : de la fiction à l'application clinique quotidienne. *Ann. Endocrinol (Paris)*, 1996, 57 : 494-501.
14. ERICKSON M. H. The interpersonal hypnotic technique for symptom correction and pain control. *Am. J. Clin. Hypn*, 1966, 8 : 198-209.
15. ERICKSON M. H. Hypnosis, its renaissance as a treatment modality. *Am J Clin Hypn*, 1970, 13 : 71-89.
16. ANSSEAU M. Intérêts des "Visual Analogues Scales" dans l'auto-évaluation de l'anxiété. *Feuillets Psych. Liège*, 1984, 17 : 14-19.
17. BOND A., LADER M. The use of analogue scales in rating subjective feelings. *Br J Med Psychol*, 1974, 47 : 211-218.
18. PALMER D. G., BRUCE A. G., MEEK A. P., MYERS D. B. Meek grip analyser. *Mol Biol Eng Comput*, 1987, 20 : 772-774.
19. BENNET H. L. The mind during surgery : the uncertain effects of anesthesia. *Adv J Mind Body Health*, 1993, 9 : 5-16.
20. EGBERT L. D., BATTIT G. E., WELCH C. E., BARTLETT G. E. Reduction of postoperative pain by encouragement and instructions of patients. *N Engl J Med*, 1964, 270 : 825-7.
21. JOHNSTON M., VOGELE C. Benefits of psychological preparation for surgery : a meta-analysis. *Ann Behav Med*, 1993, 15 : 245-256.
22. LESERMAN J., STUART E. M., MARMISH M. E., BENSON H. The efficacy of the relaxation response in preparing for cardiac surgery. *Behav Med*, 1989, 5 : 111-7.
23. MUMFORD E., SCHLESINGER H., GLASS G. The effects of psychological intervention on recovery from surgery and heart attacks : an analysis of the literature. *Am J Publ Health*, 1982, 72 : 141-151.
24. ROGERS M., REICH P. J. Psychological intervention with surgical patients : evaluation outcome. *Adv Psychosom Med*, 1986, 15 : 23-50.
25. SURMAN O. S., HACKETT T. P., SILVERBERG E. L., BEHRENDT D. M. Usefulness of psychiatric interventions in patients undergoing cardiac surgery. *Arch Gen Psychiatry*, 1974, 30 : 830-5.
26. DISBROW E., BENNETT H., OWINGS J. Effect of preoperative suggestion on postoperative mobility. *West J Med*, 1993, 158 : 488-92.
27. RAPKIN D. A., STRAUBING M., HOLROYD J. C. Guided imagery, hypnosis and recovery from head and neck cancer surgery : an exploratory study. *Int J Clin Exp Hypn*, 1991, 39 : 215-226.
28. ASHTON C., WHITWORTH G. C., SELDOMRIDGE J. A., SHAPIRO P. A., WEINBERG A. D., MICHLER R. E., SMITH C. R., ROSE E. A., FISHER S., OZ M. C. Self-hypnosis reduces anxiety following coronory artery bypass surgery. *J Cardiovasc Surg*, 1997, 38 : 69-75.
29. FEE W. E. Jr. Thyroidectomy under local anaesthesia, 1990. In : FALK S. A. (Ed.) *Thyroid disease : Endocrinology, Surgery, Nuclear medicine and Radiotherapy*, Raven Press, Ltd, New York, 585-586.
30. DITKOFF B. A., CHABOT J., FEIND C., LO GERFO P. Parathyroid surgery using monitored anesthesia care as an alternative to general anesthesia. *Am J Surg*, 1996, 172 : 698-700.
31. BARBER J. Hypnosis and the hypnotizable. *Am J Clin Hypn*, 1980, 23 : 4-9.
32. CLAWSON T. A., SWADE R. H. The hypnotic control of blood flow and pain : the cure of warts and the potential for the use of hypnosis in the treatment of cancer. *Am J Clin Hypn*, 1975, 17 : 160-169.
33. GRABOWSKA M. J. The effect of hypnosis and hypnotic suggestion on the blood flow in the extremities. *Pol Med J*, 1971, 10 : 1044-1051.
34. BEECHER H. K. Relationship of significance of wound to pain experience. *JAMA*, 1956, 16 : 1609-1613.
35. MILLER M. E., BOWERS K. S. Hypnotic analgesia and stress inoculation in the reduction of pain. *J. Abnorm. Psychol.*, 1986, 95 : 6-14.
36. PRICE D. D., BARBER J. An analysis of factor that contribute to the efficacy of hypnotic analgesia. *J. Abnorm. Psychol*, 1987, 96 : 46-51.
37. MAQUET P., FAYMONVILLE M. E., DEGUELDRE C., DELFIORE G., FRANCK G., LUXEN A., LAMY M. Functional neuroanatomy of hypnotic state. *Biol Psychiatry*, 1998 (in press).
38. ENQVIST B. L. Preoperatve hypnotherapy and preoperative suggestions in general anaesthesia : somatic responses in maxillo-facial surgery. *Hypnos*, 1991, 2 : 72-77.
39. KESSLER R., DANE J. R. Psychological and hypnotic preparation for anaesthesia and surgery : an individual differences perspective. *Int J Clin Exp Hypn*, 1996, 44 : 189-207.
40. KULKARNI R. S., BRAVERMAN L. E., PATWARDHAN N. A. Bilateral carvical plexus block for thyroidectomy and parathyroidectomy in healthy and high risk patients. *J Endocrinol Invest*, 1996, 19 : 714-18.
41. MEURISSE M., HAMOIR E., DEFECHEREUX Th., GOLLOGLY L., DETRY O., POSTAL A., JORIS J., FAYMONVILLE M. E. Bilateral neck exploration under hypnosedation. A new standard of care in primary hyperparathyroidism ? *Ann Surg*, 1998, 229 : 401-408.

Received : 15 January 1998.
Accepted : 17 January 1999.

M. Meurisse
Department of Endocrinology
B35, CHU
Domaine Universitaire du Sart-Tilman
B-4000 Liège, Belgium
Fax : + 32 (4) 366.70.69