European Annals of Otorhinolaryngology, Head and Neck diseases 131 (2014) 227–232

Available online at ScienceDirect www.sciencedirect.com

Elsevier Masson France EM|consulte www.em-consulte.com/en

SFORL Guidelines

Guidelines (short version) of the French Oto-Rhino-Laryngology – Head and Neck Surgery Society (SFORL) for the management of post-tonsillectomy pain in adults

A. Paganelli[a,*], S. Ayari Khalfallah[b], A. Brunaud[c], I. Constant[d], V. Deramoudt[e], P. Fayoux[f], A. Giovanni[a], C. Mareau[g], R. Marianowski[h], J. Michel[a], M. Mondain[i], P. Schultz[j], J.-M. Treluyer[k], C. Wood[l], S. Pondaven[m], R. Nicollas[n], SFORL work group

[a] *Service d'ORL et de chirurgie cervico-faciale, CHRU La Timone, 264, rue Saint-Pierre, 13385 Marseille cedex 05, France*
[b] *Service d'ORL et de chirurgie cervico-faciale pédiatrique, hôpital Mère-Enfant, hospices civils de Lyon, 65, boulevard Pinel, 69500 Bron, France*
[c] *Centre médical Alpha 128, 128, avenue des Champs-Lasniers, 91940 Les Ulis, France*
[d] *Hôpital Armand-Trousseau, GHUEP, UMPC, 26, avenue du Dr-Arnold-Netter, 75012 Paris, France*
[e] *Service d'ORL, hôpital Pontchaillou, CHRU de Rennes, rue Henri-Le-Guilloux, 35033 Rennes, France*
[f] *Service d'ORL et de chirurgie cervico-faciale pédiatrique, hôpital Jeanne-de-Flandre, CHRU de Lille, 59037 Lille, France*
[g] *Centre douleur chronique, CHRU La Timone, 264, rue Saint-Pierre, 13385 Marseille cedex 05, France*
[h] *Service d'ORL et de chirurgie cervico-faciale, CHRU de Brest, 5, avenue Foch, 29200 Brest, France*
[i] *Département d'ORL, CHRU de Montpellier, 34295 Montpellier cedex 5, France*
[j] *Service d'ORL et de chirurgie cervico-faciale, hôpital Hautepierre, CHRU de Strasbourg, 1, avenue Maline, 67098 Strasbourg, France*
[k] *Université Paris Descartes, 12, rue de l'École-de-Médecine, 75006 Paris, France*
[l] *Centre de prise en charge de la douleur chronique, CHRU de Limoges, 2, avenue Martin-Luther-King, 87042 Limoges, France*
[m] *Service d'ORL pédiatrique, hôpital Clocheville, 49, boulevard Beranger, 37000 Tours, France*
[n] *Service d'ORL et de chirurgie cervico-faciale pédiatrique, CHRU La Timone – Enfants, 264, rue Saint-Pierre, 13385 Marseille cedex 05, France*

ARTICLE INFO

Keywords:
Tonsillitis
Sleep apnea
Analgesics
In situ analgesia
Corticosteroids
Step 2
Step 3

ABSTRACT

Objectives: The present clinical practice guidelines cover the entire field of management of post-tonsillectomy pain. Given the French and European regulatory restrictions on the use of codeine, an update appears necessary to clarify the management of post-tonsillectomy pain in adults.
Method: A work group approached the issue of pain management, following the chronological pathway from initial consultation to postoperative period. As exhaustive a study of the literature as possible assessed the pain impact of the various surgical techniques and the efficacy of the various analgesia schedules.
Results: Guidelines on the management of post-tonsillectomy pain in adults were drawn up and graded, based on the levels of evidence of selected articles and on work group consensus. The guidelines stress the importance of patient information and seek to harmonize practice, reduce the risk of postoperative complications and above all improve control of post-tonsillectomy pain in adults.

1. Introduction

The clinical practice guidelines drawn up for the French Oto-Rhino-Laryngology – Head and Neck Surgery Society (SFORL) regard the entire field of management of post-tonsillectomy pain. They were written in the particular context of restrictions on the use of codeine in children under the age of 12 or following tonsillectomy for obstructive sleep apnea (OSA) laid down by the French Health Products Safety Agency (Agence nationale de sécurité du médicament [ANSM]) and the European Medicines Agency (EMA). Although pharmacological treatment schedules in adults are well codified, an update appeared necessary to clarify post-tonsillectomy pain management in the light of these recent restrictions.

A work group approached the issue of pain management, following the chronological pathway from initial consultation to postoperative period. As exhaustive a study of the literature as possible assessed the pain impact of the various surgical techniques and the efficacy of the various analgesia schedules.

* Corresponding author. Tel.: +33 04 91 38 60 69; fax: +33 04 91 38 77 57.
E-mail address: arnaud.paganelli@ap-hm.fr (A. Paganelli).

http://dx.doi.org/10.1016/j.anorl.2014.05.003
1879-7296/

Table 1
Correspondence between literature assessment and guidelines grade (adapted Sackett score).

Level of evidence according to literature	Strength of recommendation
Text: position paper	Guideline
Level 1	*Grade A*
High-power randomized comparative trial	High level of evidence
Meta-analysis of randomized comparative trials	
Decision analysis founded on well-conducted studies	
Level 2	*Grade B*
Low-power randomized comparative trial	Moderate level of evidence
Well-conducted non-randomized comparative trial	
Cohort study	
Level 3	*Grade C*
Case-control study	Low level of evidence
Retrospective comparative trial	
Level 4	
Comparative study with significant bias	
Retrospective study	
Case series	
Descriptive epidemiological study (transversal, longitudinal)	
Any other publication (case report, expert opinion, etc.)	*Expert opinion*[a]
No publication	

According to the French National Health Accreditation and Assessment Agency guide (ANAES) guide (January 2000: www.has-sante.fr/portail/upload/docs/application/pdf/analiterat.pdf).

[a] Unless otherwise stated, guidelines represent expert opinion.

Each prescription is individual, and the prescriber should weigh the risk/benefit ratio of respiratory and hemorrhagic complications versus pain relief.

2. Method

Expert members of the SFORL were appointed by the guidelines steering committee. Each scientific society involved appealed to its expert members, to form the writing group, which met several times in the course of drafting the guidelines. An independent editorial group read over the draft, and a coordination meeting drew up the final version.

3. Level of evidence and guideline grades

The analysis of the literature was based on levels of evidence, following the French National Health Accreditation and Assessment Agency guide, ANAES 2000. Guidelines were graded on an adapted version of the Sackett score (Table 1).

4. Guidelines

4.1. Preoperative consultation

4.1.1. Head and neck surgery consultation

Analysis of the literature found that lack of information on postoperative pain is a frequent subject of complaint, due to repercussions on school or working life. Kamarauskas et al. [1] (level of evidence 3) reported that 30% of patients were dissatisfied by the lack of information on time off school or work due to postoperative pain.

The literature also showed that analgesia is not systematically administered: Rony et al., for example, reported adapted treatment in only 17% of cases [2] (level of evidence 2). The main reasons for this lack are fear of addiction and of adverse effects [2] (level of evidence 2).

The impact of information on postoperative pain management is controversial, but lack of pre- or immediate postoperative information appears to correlate with the intensity or duration of postoperative pain [1,3,4] (levels of evidence 1, 2, 2).

Likewise, lack of information is a source of anxiety [5] (level of evidence 2), which, on the contrary, is not increased by exhaustive information on possible postoperative complications [6] (level of evidence 2), while postoperative pain is greater in patients with high preoperative or immediate postoperative anxiety scores [7] (level of evidence 2).

Patients should therefore be given objective information regarding foreseeable pain and its duration, evolution and consequences for activity in the postoperative period. Adapted information lets the patient take steps to minimize the occupational impact of pain.

In this context, it is important for the patient to be forewarned of the risk of generally intense pain that may last or be experienced as disturbing for 5 to 2 weeks [1,7] (levels of evidence 1, 2).

The importance of early relief ensured by systematic adapted analgesia should be highlighted. Given the intensity and duration of postoperative pain, the patient should be advised to foresee 1 to 2 weeks off work [1] (level of evidence 3).

The need for clear and rigorous information tailored to the individual patient's understanding should, however, be weighed against the effects of pain anticipation.

Some teams, including those of Lang et al. and of Dutt-Gupta et al. [8,9] (levels of evidence 1), have shown that warning the patient of a forthcoming act of care increases the perception of pain. Goffaux's team [10] (level of evidence 2) showed that expectation can even affect pain control at medullary level: if patients expect to experience pain, they may inhibit their diffuse noxious inhibitory control (DNIC) and experience painful stimuli more intensely.

According to studies assessing the information supplied regarding postoperative pain, only a few patients recalled having received such information, whether delivered orally, in writing or both [11] (level of evidence 2). Reminders of coherent information on postoperative pain and its management should therefore be provided by the various agents at each step along the patient's pathway.

To make the patient aware of the need for systematic pain treatment, the analgesia prescription should be delivered at the preoperative consultation, to ensure that the patient will have treatment available at discharge, especially in day-care surgery.

4.1.2. Anesthesiology consultation

The anesthesiology consultation ahead of tonsillectomy in adults should assess respiratory and hemorrhage risk so as to select the appropriate postoperative analgesia schedule and ensure adapted monitoring.

The interview should assess the risk of perioperative respiratory complications and the implications for postoperative analgesia. The anesthesiologist has two distinct situations to deal with [12] (level of evidence 1):

- the patient may be known to present obstructive sleep apnea syndrome (OSAS), for which an ENT physician has indicated tonsillectomy;
- alternatively, no OSAS may have been detected; if, in the interview, the spouse reports snoring and/or respiratory breaks, associated with daytime hypersomnolence, diagnosis should be confirmed on polysomnography.

After the interview and clinical examination, it is necessary to check that the patient has understood the causes, intensity and duration of postoperative pain. The surgeon's discharge prescription may be discussed if necessary, and the scale chosen for assessing postoperative pain should be explained (e.g., demonstrating the slide-rule).

Guideline 1

In the preoperative consultation, the patient should be given clear information and precise instructions regarding post-tonsillectomy pain and its impact on activity (grade B).

The discharge prescription should be delivered in the preoperative consultation, so that the patient will have analgesia available at home (expert opinion).

4.2. Surgery

Tonsillectomy techniques are many and various [13] (level of evidence 3) and may affect the degree of postoperative pain. Surgery successively comprises:

- exposure, generally using a Kilner-Doughty frame or, in case of very restricted oral opening, an endoscope;
- resection, which may be partial or total;
- finally, hemostasis.

The operation induces continuous pain, with paroxysms on swallowing, which mobilizes the pharyngeal muscles and soft-palate pillars. The pain is due to spasm of the pharyngeal muscles and soft-palate pillars, nerve ending irritation and superficial inflammation. Leaving a raw area at end of surgery also leads to pain on swallowing food.

Classic extracapsular tonsillar resection uses various instruments (cold scissors and mono- or bi-polar coagulation systems); in parallel, more recent instruments enable intracapsular volume reduction (laser, microdebrider, ultracision, radiofrequency ablation or coblation).

Many studies [14,15] (levels of evidence 1, 2) have compared post-tonsillectomy pain according to technique; they were either purely pediatric or mixed, and methodology varied greatly. Results have sometimes been contradictory [14,16] (levels of evidence 1), but two main points emerge:

- extracapsular tonsil resection using cold instruments causes less postoperative pain when coagulation systems are associated [14] (level of evidence 1);
- intracapsular reduction leaves no raw areas and induces less pain [14,17] (level of evidence 1).

The efficacy of peroperative local anesthesia was assessed in a meta-analysis [18] (level of evidence 2): efficacy was not demonstrated, the authors regretting the poor methodological quality of the studies reviewed.

Other studies assessed the efficacy of local injection of various combinations of anesthetic, alone or in association with vasoconstrictors or anti-inflammatories. A prospective double-blind randomized study in adults found no efficacy for bupivacaine-epinephrine [19] (level of evidence 2). Depending on the study, bupivacaine was more effective than lidocaine alone or associated to epinephrine [20] (level of evidence 2). The proximity of essential structures (carotid arteries, cervical spine) to the tonsillar fossa makes local infiltration of local anesthetics potentially risky: carotid and medullary injection and transient vocal fold paralysis have been reported [21] (level of evidence 4).

Guideline 2

Literature analysis does not allow infiltration of local anesthetics to the tonsillar fossa to be recommended to relieve postoperative pain (grade C).

4.3. In-hospital postoperative period

4.3.1. Pain assessment

Post-tonsillectomy pain assessment is not very specific. It is based on self-assessment [22]. The visual analog scale (EVA) is the instrument of reference. Numerical scales (NS) are preferred by care staff, as they do not require a support. The simple verbal scale (SVS) of 0 to 4 seems best adapted to elderly patients able to communicate.

It is advisable to use always the same scale, to allow assessment of postoperative evolution [23] (expert opinion).

For disabled adults unable to communicate, observational assessment on the Algoplus scale is simple and quick (and validated in elderly patients) [24] (expert opinion).

Guideline 3

Postoperative pain in adults should be assessed on adapted scales, to modulate analgesia (expert opinion).

4.3.2. Pharmacologic treatment: risk/benefit ratio assessment in tonsillectomy and decision algorithms

Multimodal postoperative pain management is the rule in adults, for whom there are no restrictions on step-2 analgesia [25] (level of evidence 1). Intravenous analgesics should be administered after induction and continued in the recovery room.

Paracetamol and morphine should be associated to other analgesics such as nefopam (which also has antihyperalgesic action) or tramadol, respecting contraindications.

Paracetamol and morphine require no special precautions, except that the morphine bolus should be reduced (0.5 to 1 mg) in case of OSAS, with adapted postoperative monitoring [12] (level of evidence 1).

Intraoperative ketamine can reduce pain intensity, as can immediate postoperative morphine. In this surgery, which lasts less than 1 hour, a single bolus of 0.15 to 0.30 mg/kg is injected after induction, to avoid psychodysleptic effects [26]. Ketamine is an NMDA receptor antagonist and prevents postoperative hyperalgesia by desensitizing the nervous system, with the further advantage of having a prolonged preventive analgesic effect (lasting more than 5 half-lives) [27] (level of evidence 1).

Corticosteroids and non-steroidal anti-inflammatory drugs (NSAIDs) are an attractive option pathophysiologically, despite a statistical doubt as to possible aggravation of postoperative bleeding.

Intraoperative corticosteroids in tonsillectomy are safer in adults than children, without dose-effect inducing bleeding or a significantly increased rate of revision surgery [28] (level of evidence 1). Geva and Brigger's meta-analysis [29] (level of evidence 1) even found a non-significant trend toward reduced postoperative bleeding risk with dexamethasone. Diakos's et al. meta-analysis [30] (level of evidence 1) showed that perioperative corticosteroids significantly reduced all complications (postoperative nausea and vomiting, bleeding and infection) following tonsillectomy in adults (RR: 0.59; $P = 0.00001$). Dexamethasone (at 8 mg before incision) is the corticosteroid of choice [31] (level of evidence 1).

The most recent meta-analysis of NSAIDs [32] (level of evidence 1) – including 1446 adults as well as 1747 children – found no increased risk of bleeding in general. In adults, intraoperative ketoprofen injection may be preferred to dexamethasone. The main limitation of the above meta-analyses was that the series may have lacked power to show whether corticosteroids or NSAIDs increased post-tonsillectomy bleeding, as it is a rare complication.

Corticosteroids and NSAIDs should not be associated, as that is associated with an increased risk of revision surgery [28] (level of evidence 1).

On transfer from recovery room to the ward and then at discharge home, intravenous analgesia is replaced by oral paracetamol associated to step-2 analgesics (codeine, tramadol). It has to be borne in mind than codeine is ineffective in 5–10% of caucasians who are slow metabolizers [33] (level of evidence 1). Digestive (nausea, vomiting) and neurological (dizziness, somnolence) side effects have been reported as with tramadol. If NSAIDs were used intraoperatively, it is logical to continue for 48–72 hours postoperatively (expert opinion). Oral continuation of corticosteroids after intraoperative injection is controversial [34] (level of evidence 2).

Step-3 analgesics (morphine, oxycodone) may be reserved for pain that is recalcitrant to the above associations, but should be used cautiously in OSAS patients, who should be advised to use their continuous positive air pressure (CPAP) apparatus.

Guideline 4

On transfer from recovery room to the ward and then at discharge home, intravenous analgesia should be replaced by oral paracetamol associated to step-2 analgesics (grade A).

Step-3 analgesics (morphine, oxycodone) may be reserved for pain that is recalcitrant to the above associations, but should be used cautiously in OSAS patients (grade A).

4.3.3. Dietary and activity measures

Few studies in the literature have objectively assessed the impact of postoperative recommendations regarding diet and physical activity on clinical recovery and postoperative pain. Hence, the instructions given by head and neck surgeons vary greatly from center to center and, within centers, from physician to physician [35–38] (levels of evidence 4). There is, however, general agreement to advise variable periods of liquid or soft non-spiced food, with some authors ruling out dairy products and lemon juice. Schiff [39] (level of evidence 4) recommended chewing gum in the immediate postoperative period and following days, to reduce pain on swallowing and possible associated otalgia. In a study of 92 children aged between 36 and 174 months undergoing tonsillectomy-adenoidectomy, Brodsky et al. [40] (level of evidence 2) compared the postoperative impact of two types of instructions regarding postoperative diet and physical activity. The first, “constrained”, group had to stay at home, with limited physical activity and a liquid or soft diet for 7 to 10 days; the second, “non-constrained”, group was simply advised to have a regular diet and normal physical activity, without contact sports. No significant difference emerged in terms of subjective pain threshold, drug dose intake or return to normal feeding and activity. The study concluded that there was no benefit associated with restricting diet or physical activity during the first 7 days following tonsillectomy. In 1992, Cook et al. [41] (level of evidence 2) published a study of 150 patients aged over 16 years, comparing three types of diet recommended after tonsillectomy: mainly soft, mainly solid or no special advice except to eat regularly. No significant difference was found between the three groups in terms of pain threshold or analgesic intake. In 1995, Hall and Brodsky [42] (level of evidence 2) studied the impact of two diets (liquid-soft versus unlimited) in the immediate post-tonsillectomy period, and found no significant difference but a trend toward less nausea and better general health status at 12 hours postoperatively in the unlimited diet group; the study therefore advised regular feeding with no particular restriction. There have been no studies of food temperature.

Guideline 5

Special diet and restriction of physical activity may be prescribed to prevent post-tonsillectomy bleeding but are without impact on postoperative pain (grade C).

Early return to regular feeding should be encouraged (grade B).

4.4. Pain after discharge home

4.4.1. Discharge criteria

Whatever the type of admission, discharge is authorized when the following 3 criteria are met:

- no early complications: the surgeon must check that there is no bleeding in the tonsillar fossae, and no postoperative nausea or vomiting;
- satisfactory resumption of oral feeding;
- effective oral analgesia (VAS <4): oral relay should be initiated ahead of discharge to ensure that the patient is able to take the treatment and that the treatment is effective; in case of excessive pain, hospital stay may have to be extended [43] (level of evidence 2).

Before discharge, the patient or family should receive information concerning the prescription: names of prescribed drugs, administration frequency and times, elective status, dose and total treatment duration, taking account of the surgical technique and patient age (shorter prescription in children).

It should be recommended that analgesics be taken systematically before the main meals and at bedtime for the first 4 or 5 days, and then according to the persistence of pain. Instructions for monitoring and advice concerning adjuvant treatments are to be included in this information.

4.4.2. Evolution of pain

Post-tonsillectomy pain is more intense in adults than children, probably due to the associated indication which, in adults, more often concerns iterative tonsillitis. Evolution varies from patient to patient: according to Sarny’s et al. 2012 prospective study [44] (level of evidence 2), 5 evolutive profiles could be distinguished in 232 adults operated on with the same procedure (Fig. 1). More than half of the patients showed type-II evolution; types I, III and V were found in about 15%, and type IV was extremely rare.

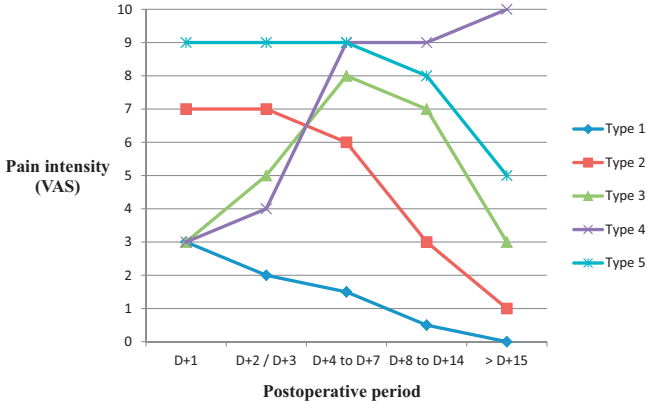

Fig. 1. Differing evolutive profiles of post-tonsillectomy pain. *According to Sarny et al. [44].*

4.4.3. Special case of tonsillar surgery in cancer

4.4.3.1. Patient. Patients undergoing tonsillectomy for tonsillar cancer show greater comorbidity than in infectious or obstructive indications, mainly due to age and history of smoking and alcohol abuse. Chronic respiratory insufficiency and liver failure should be taken into account in prescribing analgesia.

4.4.3.2. Pathology. Tonsillectomy in head and neck oncology may be diagnostic or therapeutic. Diagnostic tonsillectomy, notably in the treatment of carcinoma of unknown primary, is technically identical to classical tonsillectomy. Therapeutic tonsillectomy, on the other hand, should be extended into safe margins, requiring wide resection partially involving the pharyngeal and soft-palate muscles; this more extensive surgery is heavier and induces greater pain than simple tonsillectomy, especially as it is usually associated to neck dissection or harvesting a local or regional flap. Surgery and postoperative pain are even greater in case of recurrent tumor and/or history of cervical radiation therapy, as the resection area is then even wider.

4.4.3.3. Resection cover. To protect the resection area and limit retraction, flaps, skin graft, fibrin glue or other biomaterials are used for coverage after extensive tonsillectomy. Fibrin glue is used for its hemostatic properties, but does not reduce postoperative pain [45] (level of evidence 3). Polyglycolide sheets, fixed with fibrin glue, have been reported to reduce pain and accelerate healing [46] (level of evidence 3).

4.4.3.4. Treatment of pain. Oncologic tonsillar surgery is responsive to the usual analgesics prescribed in oncology and heavy surgery. Correct adaptation of analgesia is essential, because of:

- the length of treatment (surgery, often followed by cervical radiation therapy that prolongs pain);
- patient health status (frequent initial denutrition due to tumor-related dysphagia, followed by post-treatment dysphagia) [47] (level of evidence 3).

Acknowledgments

The authors thank all the members of the editorial group who took part in drawing up these guidelines: Dr Daniel Annequin, anesthesiologist, Paris; Dr Eric Baubillier, anesthesiologist, Massy; Dr Cécile Bedfert, head and neck and maxillofacial surgeon, Rennes; Dr Anita Chatellier-Miras, head and neck and maxillofacial surgeon, Rennes; Pr Claude Ecoffey, anesthesiologist, Rennes; Dr Céline Forman-Glard, ENT, Marseille; Dr Gildas Gueret, anesthesiologist, Brest; Dr Florentia Kaguelidou, pediatric pharmacologist, Paris; Pr Bruno Laviolle, pharmacologist, public health physician, Rennes; Dr Véronique Lesage, anesthesiologist, Tours; Dr Catherine Nowak, ENT, Paris; Pr Gilles Orliaguet, anesthesiologist, Paris; Dr Céline Richard, head and neck and maxillofacial surgeon, Villefranche; Dr Christian Sadek, community physician, Cazals; Dr Barbara Tourniaire, pediatrician, Paris; Pr Francis Veyckemans, anesthesiologist, Brussels.

References

[1] Kamarauskas A, Dahl MR, Hlidarsdottir T, et al. Need for better analgesic treatment after tonsillectomy in ear, nose and throat practices. Dan Med J 2013;60:A4639.
[2] Rony RYZ, Fortier MA, Chorney JM, et al. Parental postoperative pain management: attitudes, assessment, and management. Pediatrics 2010;125:E1372–8.
[3] Christiano B, Tarbell SE. Brief report: behavioral correlates of postoperative pain in toddlers and preschoolers. J Pediatr Psychol 1998;23:149–54.
[4] Kankkunen P, Vehvilainen-Julkunen K, Pietila AM, et al. Is the sufficiency of discharge instructions related to children's postoperative pain at home after day surgery? Scand J Caring Sci 2003;17:365–72.
[5] Shirley PJ, Thompson N, Kenward M, et al. Parental anxiety before elective surgery in children – a British perspective. Anaesthesia 1998;53:956–9.
[6] Kain ZN, Wang SM, Caramico LA, et al. Parental desire for perioperative information and informed consent: a two-phase study. Anesth Analg 1997;84:299–306.
[7] Stewart DW, Ragg PG, Sheppard S, et al. The severity and duration of postoperative pain and analgesia requirements in children after tonsillectomy, orchidopexy, or inguinal hernia repair. Pediatr Anesth 2012;22:136–43.
[8] Lang EV, Hatsiopoulou O, Koch T, et al. Can words hurt? Patient-provider interactions during invasive procedures. Pain 2005;114:303–9.
[9] Dutt-Gupta J, Bown T, Cyna AM. Effect of communication on pain during intravenous cannulation: a randomized controlled trial. Br J Anaesth 2007;99:871–5.
[10] Goffaux P, Redmond WJ, Rainville P, et al. Descending analgesia – when the spine echoes what the brain expects. Pain 2007;130:137–43.
[11] Hegarty M, Calder A, Davies K, et al. Does take-home analgesia improve postoperative pain after elective day case surgery? A comparison of hospital vs parent-supplied analgesia. Pediatr Anesth 2013;23:385–9.
[12] Payen JF, Jaber S, Levy P, et al. Obstructive sleep-apnoea syndrome in adult and its perioperative management. Ann Fr Anesth Reanim 2010;29:787–92.
[13] Walner DL, Parker NP, Miller RP. Past and present instrument use in pediatric adenotonsillectomy. Otolaryngol Head Neck Surg 2007;137:49–53.
[14] Ashbach MN, Ostrower ST, Parikh SR. Tonsillectomy techniques and pain: a review of randomized controlled trials and call for standardization. ORL J Otorhinolaryngol Relat Spec 2007;69:364–70.
[15] Arya A, Donne AJ, Nigam A. Double-blind randomized controlled study of coblation tonsillotomy versus coblation tonsillectomy on postoperative pain. Clin Otolaryngol 2003;28:503–6.
[16] Burton M, Manning S, Rosenfeld R. Extracts from The Cochrane Library: Coblation versus other surgical techniques for tonsillectomy (review). Otolaryngol Head Neck Surg 2008;138(1):4–7.
[17] Walton J, Ebner Y, Stewart MG, et al. Systematic review of randomized controlled trials comparing intracapsular tonsillectomy with total tonsillectomy in a pediatric population. Arch Otolaryngol Head Neck Surg 2012;138:243–9.
[18] Hollis LJ, Burton MJ, Millar JM. Perioperative local anaesthesia for reducing pain following tonsillectomy. Cochrane Database Syst Rev 2000;4:CD001874.
[19] Ginstrom R, Silvola J, Saarnivaara L. Local bupivacaine-epinephrine infiltration combined with general anesthesia for adult tonsillectomy. Acta Otolaryngol 2005;125:972–5.
[20] Ozmen OA, Ozmen S. Topical bupivacaine compared to lidocaine with epinephrine for post-tonsillectomy pain relief in children: a randomized controlled study. Int J Pediatr Otorhinolaryngol 2011;75:77–80.
[21] Weksler N, Nash M, Rozentsveig V, et al. Vocal cord paralysis as a consequence of peritonsillar infiltration with bupivacaine. Acta Anaesth Scand 2001;45:1042–4.
[22] Fletcher D. Évaluation et principes de traitement d'une douleur aiguë. In: Fletcher D, Chauvin M, editors. Douleurs aiguës. Paris: Éditions Arnette; 2006. p. 1–7.
[23] Belbachir A. Pourquoi développer l'autoévaluation. In: Congrès de la Sfar. 2008.
[24] Rat P, Jouve E, Pickering G, Donnarel L, Nguyen L, Michel M, et al. Variation of an acute pain-behavior scale for older persons with inability to communicate verbally: Algoplus. Eur J Pain 2011;15:198.e1–10.
[25] Beloeil H. Les associations médicamenteuses antalgiques. In: 53e Congrès national d'anesthésie et de réanimation. 2011 [page consultée le 25/11/2013] http://www.Sfar.org
[26] Chauvin M. Hyperalgésie : quelle est la prévention, et quel est son impact clinique ? 53e Congrès national d'anesthésie et de réanimation. 2011 [page consultée le 25/11/2013] http://www.Sfar.org
[27] Martinez V, Baudic S, Fletcher D. Chronic postsurgical pain. Ann Fr Anesth Reanim 2013;32:422–35.
[28] Plante J, Turgeon AF, Zarychanski R, Lauzier F, Vigneault L, Moore L, et al. Effect of systemic steroids on post-tonsillectomy bleeding and reinterventions: systematic review and meta-analysis of randomised controlled trials. BMJ Clinical research ed 2012;345:e5389.
[29] Geva A, Brigger MT. Dexamethasone and tonsillectomy bleeding: a meta-analysis. Otolaryngol Head Neck Surg 2011;144:838–43.
[30] Diakos EA, Gallos ID, El-Shunnar S, et al. Dexamethasone reduces pain, vomiting and overall complications following tonsillectomy in adults: a systematic review and meta-analysis of randomised controlled trials. Clin Otolaryngol 2011;36:531–42.
[31] Marret E, Bonnet F. Corticoïdes en anesthésie. In: 55e Congrès national d'anesthésie et de réanimation. 2013 [page consultée le 25/11/2013] http://www.Sfar.org
[32] Riggin L, Ramakrishna J, Sommer DD, et al. A 2013 updated systematic review & meta-analysis of 36 randomized controlled trials; no apparent effects of non-steroidal anti-inflammatory agents on the risk of bleeding after tonsillectomy. Clin Otolaryngol 2013;38:115–29.
[33] Aubrun F, Bobineau I, Cognet V. Quel avenir pour les antalgiques de palier II ? 53e Congrès national d'anesthésie et de réanimation. 2011 [page consultée le 25/11/2013] http://www.Sfar.org
[34] Lachance M, Lacroix Y, Audet N, et al. The use of dexamethasone to reduce pain after tonsillectomy in adults: a double-blind prospective randomized trial. Laryngoscope 2008;118:232–6.
[35] Deweese D, Saunders WH. Textbook of otolaryngology. 6th ed Saint Louis, MO: CV Mosby Co.; 1982. p. 74.

[36] Kornblut A, Komblut AD. Tonsillectomy and adenoidectomy. In: Paparella MM, Shumrick DA, editors. Otolatyngology, III. Philadelphia: WB Saunders; 1980. p. 2282–301.
[37] Paradise JL. Tonsillectomy and adenoidectomy. In: Bluestone C, Stool S, editors. Pediatric otolaryngology. Philadelphia: WB Saunders; 1990. p. 915–26.
[38] Zalzal GH, Cotton RT. Adenotonsillar disease. In: Cummings, editor. Otolaryngology head and neck surgery. Saint Louis, MO: CV Mosby Co.; 1986. p. 1189–211.
[39] Schiff M. Chewing gum and tonsillectomy. Laryngoscope 1982;92:820.
[40] Brodsky L, Radomski K, Gendler J. The effect of postoperative instructions on recovery after tonsillectomy and adenoidectomy. Int J Pediatr Otorhinolaryngol 1993;25:133–40.
[41] Cooks JA, Murrant NJ, Evans KL, et al. A randomized comparison of three post-tonsillectomy diets. Clin Otolaryngol Allied Sci 1992;17(1):28–31.
[42] Hall MD, Brodsky L. The effect of postoperative diet on recovery in the first 12 hours after tonsillectomy and adenoidectomy. Int J Pediatr Otorhinolaryngol 1995;31:215–20.
[43] Lescanne E, Chiron B, Constant I, et al. Pediatric tonsillectomy: clinical practice guidelines. Eur Ann Otorhinolaryngol Head Neck Dis 2012;129:264–71.
[44] Sarny S, Habermann W, Ossimitz G, et al. Significant post-tonsillectomy pain is associated with increased risk of hemorrhage. Ann Otol Rhinol Laryngol 2012;121:776–81.
[45] Segal N, Puterman M, Rotem E, et al. A prospective randomized double-blind trial of fibrin glue for reducing pain and bleeding after tonsillectomy. Int J Pediatr Otorhinolaryngol 2008;72:469–73.
[46] Shinozaki T, Hayashi R, Ebihara M, et al. Mucosal defect repair with a polyglycolic acid sheet. Jpn J Clin Oncol 2013;43:33–6.
[47] Diz Dios P, Seoane Leston J. Oral cancer pain. Oral Oncol 2010;46:448–51.