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POST-TONSILLECTOMY PAIN IN ADULTS: CURRENT EVIDENCE ON MULTIMODAL ANALGESIA AND PERSPECTIVES FOR PERSONALIZED PAIN MANAGEMENT

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Abstract

Background: Tonsillectomy remains one of the most frequently performed surgical procedures in otorhinolaryngology. Despite advances in surgical and anaesthetic techniques, post-tonsillectomy pain remains a major clinical problem, particularly in adults. Severe pain may persist for several days, impair swallowing and oral intake, delay recovery, increase the need for rescue analgesics, and contribute to unplanned medical contacts after discharge. The systematic review by Tolska et al. demonstrated that individual systemic analgesics provide only weak-to-moderate analgesic effects and supported the use of multimodal analgesia. Since publication of that review, additional evidence has emerged concerning non-steroidal anti-inflammatory drugs (NSAIDs), dexamethasone, opioid-sparing strategies, selective cyclooxygenase-2 inhibitors, and adjunctive treatments.

Objective: To review the current evidence on the mechanisms, clinical characteristics, and pharmacological management of post-tonsillectomy pain in adults, with particular attention to the evolution of multimodal and opioid-sparing analgesia.

Materials and methods: A narrative literature review was performed based on the systematic review of Tolska et al. and subsequent peer-reviewed evidence

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published between 2019 and September 2026. Particular attention was given to systematic reviews, meta-analyses, procedure-specific recommendations, randomized controlled trials, and contemporary observational studies evaluating analgesic efficacy, opioid consumption, postoperative nausea and vomiting, and post-tonsillectomy haemorrhage.

Results: Current evidence supports multimodal analgesia based primarily on paracetamol and NSAIDs, with intravenous dexamethasone administered perioperatively. The 2021 PROSPECT guideline recommends paracetamol and NSAIDs as the basic regimen, a single intraoperative dose of intravenous dexamethasone, and opioids only as rescue medication. A 2025 systematic review and meta-analysis confirmed significant pain reduction with perioperative NSAIDs and intravenous steroids and found no statistically significant increase in primary or secondary postoperative bleeding associated with NSAID use in the analysed studies. Recent evidence also indicates that selective COX-2 inhibitors may provide effective analgesia without a demonstrated increase in bleeding risk, although comparative evidence remains insufficient. Novel adjunctive approaches, including intraoral sucralfate, require further investigation.

Conclusion: Contemporary evidence supports a multimodal, opioid-sparing strategy for adult post-tonsillectomy pain. The major unresolved issue is not the efficacy of individual analgesics but the optimization of combinations, timing, duration, and patient-specific selection of analgesic interventions. Future studies should incorporate individual risk factors, surgical technique, pain trajectories, functional recovery, analgesic consumption, and bleeding complications to develop personalized post-tonsillectomy analgesic protocols.

Keywords: Tonsillectomy; postoperative pain; post-tonsillectomy pain; multimodal analgesia; non-steroidal anti-inflammatory drugs; paracetamol; dexamethasone; opioids; postoperative haemorrhage; adults.

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Introduction

Tonsillectomy is one of the most frequently performed operations in otorhinolaryngology and is commonly undertaken as a day-case procedure. Nevertheless, postoperative pain remains one of its most important clinical complications. Patients frequently experience substantial throat pain, odynophagia, dysphagia, referred otalgia, reduced oral intake, sleep disturbance, and limitations in normal daily activities. Importantly, pain after tonsillectomy is not necessarily confined to the immediate postoperative period and may remain clinically significant for approximately one week or longer.

The clinical relevance of this problem was clearly demonstrated by Tolska et al., who reported that intense post-tonsillectomy pain is frequently undertreated and that pain represents an important reason for patients to contact healthcare professionals after discharge [1]. Their systematic review and meta-analysis included 29 randomized controlled trials involving 1816 adult and adolescent patients. Although paracetamol, dexamethasone, gabapentinoids and several NSAIDs demonstrated beneficial effects, the magnitude of benefit from individual interventions was generally weak to moderate. The authors therefore concluded that a multimodal analgesic strategy was required [1].

The characteristics of post-tonsillectomy pain in adults may differ from those observed in children. Adult tonsillectomy is frequently performed for chronic or recurrent infection, in which fibrosis and adhesions may make tonsillar dissection more difficult and increase tissue trauma and the requirement for haemostasis. Consequently, postoperative inflammation and nociceptive stimulation may be particularly pronounced in adult patients [1].

Pain management is additionally complicated by the anatomical location of the surgical wound. The tonsillar fossae are continuously exposed to swallowing, salivary secretion, mechanical irritation and changes in local temperature and pH. These factors may contribute to persistent nociceptive stimulation during the postoperative healing period.

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Historically, opioids were frequently used as the principal treatment for severe post-tonsillectomy pain. However, opioid-associated sedation, nausea, vomiting, constipation and respiratory depression are particularly undesirable following surgery involving the upper respiratory tract. The modern approach has therefore shifted toward opioid-sparing multimodal analgesia [1,2].

The purpose of this review is to summarize the evolution of evidence regarding post-tonsillectomy pain management from the systematic review of Tolska et al. to the current evidence available in 2026.

Materials and Methods

This article represents a narrative review with an updated literature assessment. The systematic review of Tolska et al. [1] was used as the principal historical evidence base because it specifically evaluated systemic analgesics and dexamethasone for post-tonsillectomy pain in adults and adolescents.

Subsequent evidence was considered from systematic reviews, meta-analyses, procedure-specific clinical recommendations, randomized controlled trials and observational studies published after 2019. Particular attention was paid to publications addressing:

1. multimodal analgesia;
2. paracetamol and NSAIDs;
3. dexamethasone;
4. selective COX-2 inhibitors;
5. opioid-sparing strategies;
6. postoperative haemorrhage;
7. functional recovery and oral intake;
8. novel adjunctive interventions.

The interpretation of evidence was based on clinically relevant outcomes, including postoperative pain intensity, rescue analgesic requirements, opioid

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consumption, postoperative nausea and vomiting, bleeding complications, return to oral intake and recovery of daily activities.

Clinical Characteristics and Pathophysiology of Post-Tonsillectomy Pain

Post-tonsillectomy pain is predominantly nociceptive and inflammatory in origin. Removal of the palatine tonsils produces bilateral mucosal wounds within the oropharynx. Tissue injury activates peripheral nociceptors and initiates an inflammatory response involving prostaglandins, cytokines and other inflammatory mediators.

The pain trajectory is clinically important. Immediate postoperative pain may be substantial, but symptoms may persist or fluctuate during the first postoperative week. Pain can increase during swallowing, resulting in reduced fluid and food intake. Inadequate oral intake may subsequently contribute to dehydration and may further impair recovery.

Referred otalgia is also common and is generally attributed to shared sensory pathways involving the glossopharyngeal and vagal nerves. Consequently, patients may report ear pain even though no primary ear pathology is present.

The combination of persistent mucosal inflammation, swallowing-related mechanical stimulation and referred pain explains why a single short-acting analgesic administered during surgery is insufficient for many patients.

The systematic review by Tolska et al. highlighted an important methodological limitation of the existing evidence: most available studies assessed analgesic efficacy during the first 24 hours, whereas clinically significant pain may continue throughout the first postoperative week [1]. This remains an important research gap.

Evolution from Single-Agent to Multimodal Analgesia

The concept of multimodal analgesia is based on simultaneous modulation of different pain pathways. Rather than relying on a single drug, medications with

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complementary mechanisms are combined to improve analgesia while reducing the dose and adverse effects associated with individual agents.

The 2019 review demonstrated that several individual interventions could reduce pain or rescue analgesic requirements, but the effect sizes were generally limited [1]. These findings supported the transition toward multimodal treatment.

The subsequent PROSPECT guideline systematically evaluated 226 randomized controlled trials and recommended a basic analgesic regimen consisting of paracetamol and NSAIDs administered perioperatively and continued postoperatively, together with a single intraoperative dose of intravenous dexamethasone [2].

According to this approach, opioids should not constitute routine baseline therapy but should be reserved for rescue treatment when pain remains inadequately controlled [2].

This strategy is particularly relevant in ambulatory surgery, where patients must continue analgesic treatment at home without continuous professional monitoring.

Paracetamol

Paracetamol remains an important component of multimodal analgesia because of its established analgesic and antipyretic effects and generally favorable safety profile when administered within recommended doses.

In the Tolska review, pooled analyses demonstrated a reduction in pain intensity with paracetamol on the day of surgery [1]. However, its effect as a single intervention was limited, supporting its combination with other analgesic classes. The PROSPECT recommendations consequently position paracetamol as part of the basic postoperative regimen rather than as sole therapy [2].

From a clinical perspective, paracetamol is particularly valuable because it can be combined with NSAIDs without duplicating their principal mechanisms of

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action. This pharmacological complementarity forms the basis of many contemporary multimodal protocols.

Non-Steroidal Anti-Inflammatory Drugs

NSAIDs represent one of the most important components of contemporary post-tonsillectomy analgesia. Their analgesic effect is mediated predominantly through inhibition of cyclooxygenase and reduction of prostaglandin synthesis. The Tolska review identified beneficial effects of several NSAIDs, including ketoprofen, ibuprofen, lornoxicam, parecoxib, rofecoxib and indomethacin, although the evidence was heterogeneous and was frequently limited to the day of surgery [1].

More recent evidence has strengthened the role of NSAIDs. The PROSPECT guideline recommends NSAIDs as a first-line component of the perioperative and postoperative analgesic regimen [2].

A 2025 systematic review and meta-analysis involving 111 publications and 7566 patients found that perioperative NSAID administration significantly reduced pain during the first 24 hours. The pooled analysis demonstrated a mean difference favoring NSAIDs, although substantial heterogeneity was observed in some analyses [3]. Importantly, the same review found no statistically significant increase in either primary or secondary postoperative bleeding associated with NSAID treatment in the analysed studies [3].

These findings are clinically important because concern about post-tonsillectomy haemorrhage has historically limited NSAID use. Contemporary evidence has consequently shifted the balance toward their use as part of multimodal analgesia when no individual contraindication is present.

Nevertheless, NSAIDs should not be considered universally risk-free. Individual patient factors, renal function, gastrointestinal risk, hypersensitivity, concomitant medications and bleeding risk must be considered before administration.

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Selective COX-2 Inhibitors

Selective COX-2 inhibitors represent a potentially useful alternative within multimodal analgesia because they provide anti-inflammatory and analgesic effects while producing less platelet inhibition than traditional non-selective NSAIDs.

A recent systematic review published in 2026 included 15 studies, 14 of which were randomized controlled trials. The meta-analysis found no statistically significant increase in bleeding with selective COX-2 inhibitors compared with non-selective NSAIDs or placebo (OR 1.27; 95% CI 0.51–3.16). The authors also found evidence of analgesic efficacy compared with placebo [4].

However, the evidence is not sufficient to conclude that COX-2 inhibitors are superior to conventional NSAIDs. The authors specifically noted insufficient evidence for a direct comparison of efficacy and safety between selective COX-2 inhibitors and non-selective NSAIDs [4].

Therefore, COX-2 inhibitors should currently be considered a potential alternative rather than a universally preferred treatment.

Dexamethasone

Dexamethasone has a dual clinical role in tonsillectomy because it may reduce postoperative pain and postoperative nausea and vomiting.

The Tolska review demonstrated a reduction in pain intensity following dexamethasone administration, although the magnitude of benefit from single-agent treatment was generally limited [1]. Interestingly, multiple-dose dexamethasone regimens were associated with analgesic effects extending beyond the first postoperative day.

The PROSPECT guideline subsequently recommended a single intraoperative intravenous dose of dexamethasone as part of the standard analgesic regimen [2]. A 2025 meta-analysis further supported the role of perioperative steroids. In nine studies including 536 patients, steroid administration significantly reduced pain

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during the first 24 postoperative hours, with a pooled mean difference of approximately -1.23 points using a random-effects model [3].

The same review found no statistically significant difference in primary or secondary postoperative bleeding between steroid and control groups [3].

Thus, current evidence supports perioperative dexamethasone as an important component of multimodal analgesia, particularly when its analgesic and antiemetic effects are considered together.

Gabapentinoids

Gabapentin and pregabalin have been investigated because modulation of calcium channels may reduce central sensitization and postoperative hyperalgesia.

In the Tolska review, gabapentinoids were associated with reduced pain intensity on the day of surgery [1]. However, their clinical role remains less clearly established than that of paracetamol and NSAIDs.

The PROSPECT guideline suggests preoperative gabapentinoids primarily when the basic analgesic regimen is contraindicated [2].

Potential adverse effects, including sedation and dizziness, should be considered, particularly in ambulatory patients. Therefore, routine administration to all patients cannot currently be justified on the basis of the available evidence.

Opioids and Opioid-Sparing Analgesia

Opioids remain highly effective analgesics but have an unfavorable adverse-effect profile in the context of tonsillectomy.

Sedation, respiratory depression, nausea, vomiting and constipation are particularly relevant after upper-airway surgery. These effects can interfere with oral intake and may complicate recovery.

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The contemporary approach therefore emphasizes opioid-sparing analgesia. The PROSPECT guideline recommends opioids only as rescue analgesics following adequate baseline treatment with non-opioid medications [2].

Evidence from adult clinical practice also supports this shift. A study of adults undergoing tonsillectomy found that patients prescribed ibuprofen after surgery were substantially less likely to fill an opioid prescription than patients who did not receive ibuprofen, without a significant difference in bleeding rates [5].

This observation is important because reducing opioid exposure is not merely a pharmacological objective; it may also improve postoperative recovery and reduce unnecessary exposure to opioid medications.

Post-Tonsillectomy Haemorrhage and the Safety of Analgesic Therapy

Post-tonsillectomy haemorrhage remains one of the most important complications influencing analgesic selection.

Historically, NSAIDs were often avoided because of their potential effects on platelet function. However, contemporary systematic evidence does not support routine avoidance of NSAIDs solely because of concerns about postoperative bleeding.

The 2025 meta-analysis found no statistically significant difference in primary bleeding between NSAIDs and comparator medications (OR 1.49; 95% CI 0.76–2.93) and no significant difference in secondary bleeding (OR 0.97; 95% CI 0.38–2.47) [3].

At the same time, recent observational data indicate that post-tonsillectomy haemorrhage remains clinically important. A 2025 adult cohort study reported an increase in diagnosed post-tonsillectomy haemorrhage from 4.1% in 2008 to 6.2% in 2022, accompanied by a substantial increase in return-to-operating-room procedures [6]. During the same period, the use of ibuprofen and acetaminophen increased, highlighting the importance of investigating the relationship between

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evolving analgesic protocols, surgical techniques and haemorrhagic complications rather than attributing causality to a single medication [6].

Therefore, bleeding risk should be evaluated in a multifactorial manner, considering patient characteristics, surgical technique, haemostasis, medication exposure and postoperative behavior.

Emerging Adjunctive Approaches

The contemporary literature is increasingly evaluating adjunctive approaches designed to reduce pain beyond conventional systemic analgesics.

A 2025 randomized clinical study evaluated topical ropivacaine combined with dexamethasone spray in 172 adults and reported lower resting pain scores over the 10-day postoperative period compared with control groups [7]. Such findings suggest that local or topical interventions may have a role in future multimodal protocols, although additional independent studies are required.

Particularly interesting is emerging evidence concerning sucralfate. A 2026 systematic review and meta-analysis identified 13 studies evaluating perioperative intraoral sucralfate. The intervention was associated with reductions in throat pain, swallowing pain, otalgia and analgesic consumption, as well as improved mucosal healing and earlier return to regular dietary intake. No significant differences in postoperative bleeding or nausea/vomiting were observed [8].

These findings are promising because they suggest that future post-tonsillectomy treatment may combine systemic analgesia with local strategies directed at wound healing and mucosal protection.

However, these interventions should currently be regarded as adjunctive rather than replacements for evidence-based systemic analgesia.

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Toward Personalized Post-Tonsillectomy Pain Management

One of the major limitations of the current evidence is the assumption that a uniform analgesic regimen is appropriate for all patients.

Pain intensity after tonsillectomy may be influenced by age, indication for surgery, degree of tonsillar fibrosis, surgical technique, operative time, intraoperative blood loss, baseline pain sensitivity, psychological factors, sleep disorders, previous analgesic exposure and individual susceptibility to postoperative nausea and vomiting.

The 2019 systematic review emphasized the heterogeneity of available studies and the predominance of short follow-up periods [1]. The PROSPECT guideline similarly highlighted the need for further adequately powered studies evaluating patient-specific risk factors [2].

A more clinically relevant research model should therefore evaluate pain as a longitudinal trajectory rather than as a single measurement during the first 24 postoperative hours.

Future studies should include:

- pain intensity at standardized postoperative time points;
- swallowing-related pain;
- referred otalgia;
- sleep disturbance;
- oral fluid and food intake;
- time to return to normal diet;
- time to return to normal daily activities;
- rescue analgesic consumption;
- opioid exposure;
- nausea and vomiting;
- postoperative haemorrhage;
- patient-reported satisfaction;
- adverse drug reactions.

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Such a multidimensional approach could facilitate development of personalized analgesic algorithms for adult tonsillectomy.

Discussion

The evidence accumulated since the publication of Tolska et al. demonstrates a gradual shift in the management of post-tonsillectomy pain from single-agent treatment toward structured multimodal analgesia.

The principal contribution of the 2019 review was to demonstrate that individual systemic analgesics generally have only weak-to-moderate effects and that the evidence base was limited by short follow-up and substantial clinical heterogeneity [1]. Subsequent evidence has not invalidated this conclusion; rather, it has strengthened the rationale for combining complementary interventions.

The 2021 PROSPECT recommendations established a practical framework in which paracetamol and NSAIDs form the basic analgesic regimen, intravenous dexamethasone provides additional analgesic and antiemetic effects, and opioids are reserved for rescue treatment [2].

The 2025 meta-analysis further demonstrated significant analgesic effects of NSAIDs and steroids and provided reassuring evidence concerning postoperative bleeding [3]. Nevertheless, heterogeneity remains substantial, especially regarding drug dose, timing, route of administration, surgical technique and patient population.

This heterogeneity is particularly relevant for adult patients. Many earlier trials combined adults and children, whereas postoperative pain trajectories and surgical indications may differ considerably between these groups.

Another important development is the increasing interest in opioid-sparing approaches. The objective is not necessarily complete elimination of opioids in every patient, but reduction of unnecessary opioid exposure through adequate baseline analgesia.

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Emerging interventions such as COX-2 inhibitors, topical anesthetic combinations and sucralfate may expand the range of available adjunctive therapies. However, these approaches require confirmation through large, well-designed randomized trials before routine adoption.

The main research priority should therefore shift from determining whether a particular drug "works" to identifying which combination, at what time, for which patient, and for how long provides the optimal balance between analgesia, functional recovery and safety.

Conclusion

Post-tonsillectomy pain remains a significant clinical problem in adult otorhinolaryngology despite substantial advances in perioperative care.

The evidence available in 2026 supports a multimodal, opioid-sparing strategy. Paracetamol and NSAIDs constitute the principal components of baseline analgesia, while perioperative intravenous dexamethasone provides additional analgesic and antiemetic benefits. Opioids should generally be reserved for rescue treatment.

Contemporary evidence does not demonstrate a consistent increase in postoperative haemorrhage associated with appropriately selected NSAID therapy, although individual patient risk factors must always be considered. Selective COX-2 inhibitors may represent an alternative analgesic option, but comparative evidence remains insufficient.

Novel adjunctive treatments, including sucralfate and topical anesthetic approaches, are promising but require further high-quality investigation.

The principal unresolved issue is the absence of universally accepted, individualized analgesic algorithms that account for patient characteristics, surgical technique, pain trajectory and risk of complications. Future research should therefore focus on personalized multimodal analgesia, prolonged follow-

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up through at least the first postoperative week, functional recovery and clinically meaningful patient-reported outcomes.

References

1. Tolska HK, Hamunen K, Takala A, Kontinen VK. Systematic review of analgesics and dexamethasone for post-tonsillectomy pain in adults. *Br J Anaesth.* 2019;123(2):e397-e411. doi:10.1016/j.bja.2019.04.063.
2. Aldamluji N, Burgess A, Pogatzki-Zahn E, et al. PROSPECT guideline for tonsillectomy: systematic review and procedure-specific postoperative pain management recommendations. *Anaesthesia.* 2021;76:947-961. doi:10.1111/anae.15299.
3. Geißler K, Scham D, Meißner W, Schlattmann P, Guntinas-Lichius O, et al. Systematic review and meta-analysis of pain management after tonsillectomy. *Sci Rep.* 2025;15:1476.
4. [Authors]. The safety of selective COX-2 inhibitors in tonsillectomy patients: a systematic review. *J Laryngol Otol.* 2026. doi:10.1017/S0022215126105039.
5. [Authors]. Ibuprofen prescription following adult tonsillectomy reduces postoperative opioid use. 2022. PMID: 35429845.
6. [Authors]. Are more adults bleeding after tonsillectomy than in the past? *Laryngoscope.* 2025;135:1958-1963.
7. [Authors]. Topical ropivacaine combined with dexamethasone spray relieves post-tonsillectomy pain in adults. *Laryngoscope.* 2025. PMID: 40536313.
8. Kim DH, Jang DW, Hwang SH. Effect of perioperative sucalfate administration on pain control after tonsillectomy: a systematic review and meta-analysis. 2026. doi:10.1177/00034894261449776.