

e-ISSN: 2345-0592

Online issue

Indexed in *Index Copernicus*

Medical Sciences

Official website:
www.medicisciences.com



Postoperative pain management after tonsillectomy: a literature review

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Abstract

Tonsillectomy is one of the most frequently performed surgeries by otorhinolaryngologists globally. When performed with proper indications, tonsillectomies provide long-term improvements in health and quality of life. It is different from other surgical procedures because the wounds are left open to heal by secondary intention, thus the main complaint from patients after the surgery is severe pain. None of the modern surgery techniques stand out as superior when comparing their post-surgery pain levels. A wide variety of studies have been conducted where different types of pain-relieving medications were compared, however, to this day, there are no clear pain management guidelines after tonsillectomies. Acetaminophen and ibuprofen provide only a moderate relief of pain. Dexamethasone, when used in multimodal treatment, provides higher analgesia than the monotherapy of nonsteroid anti-inflammatory drugs. The research on opioid analgesics is very limited, yet available studies show, that it bestows excellent pain relief for patients after the removal of palatine tonsils with little to no adverse effects. Further research is needed to determine the most optimal course of action, providing an adequate pain management method for patients after tonsillectomies.

Keywords: postoperative pain management, tonsillectomy, surgical technique, pain medication.

Introduction

Although the necessity for tonsillectomies has reduced after the discovery of antibacterial treatment, however, it remains one of the most common surgical procedures performed by otorhinolaryngologists. Tonsillectomies are performed more than 400 000 times in the European Union each year (1). Historical archives, describing the procedure, date back a thousand years before Christ in India (2). Over the years, technological advancements in medicine had a large impact on tonsillectomies, as new and more advanced instruments had been invented, the surgical technique had been improved and general anesthesia started being used during surgeries. Sadly, the removal of tonsils is still a very controversial procedure, simply because, despite being a relatively simple technique, it remains dreadfully unpleasant for patients and presents a considerably large amount of complications (3). Severe pain is the most common complaint, during the postoperative period (4). Most patients report this pain to be similar to the one experienced during acute tonsillitis (5). Studies confirm, that analgesia after the surgery is not sufficient enough, however, there is no worldwide consensus on what the most optimal pain management approach should be (6).

Indications for tonsillectomy

Due to the adequate use of antibacterial treatment, the rates of tonsillectomies had been reduced, however, it remains a commonly performed procedure in both adults and children (7). Studies show that, when performed with the proper indications, tonsillectomies are associated with

long-term improvements in health, quality of life, and lower utilization of medical resources (1). Authors mainly name these following indications for surgical treatment:

- Recurrent tonsillitis;
- Peritonsillar abscess;
- Tonsil hyperplasia causing obstructive sleep apnoea symptoms;
- Suspected tonsillar malignancy (8).

Tonsillectomies, in general, are different from other surgical procedures, because unlike other surgeries, wounds, after the removal of palatine tonsils, are left unsutured to heal by secondary intention (7). For this reason, patients experience severe pain after surgery. The pain is the result of the disruption of mucosa and glossopharyngeal and vagal nerve fiber irritation followed by inflammation and spasm of the pharyngeal muscles that leads to ischemia and a protracted cycle of pain (5). Some studies claim, that patients with recurrent tonsillitis qualified for tonsillectomy, experience less pain than those, who were treated surgically for other indications (9). However, the evidence is scarce and further research should be conducted to form a valid conclusion.

Surgery techniques and postoperative pain

Several techniques have been described in literature to reduce morbidity and enhance recovery post-surgery. The most common surgical techniques for tonsillectomies are cold dissection, also known as traditional tonsillectomy, monopolar-bipolar diathermy dissection, harmonic scalpel tonsillectomy, and coblation dissection (5). Postoperative pain and hemorrhage are the most

important focuses when comparing different techniques.

Cold dissection is one of the oldest methods for performing tonsillectomies. This technique has been used for over a hundred years (2). During the procedure, the palatine tonsil and capsule are dissected from surrounding tissue using a scalpel or scissors. The inferior pole is then amputated with a snare. Many studies are comparing cold dissection with other surgical methods, however, there is no significant evidence supporting traditional tonsillectomy over other more modern techniques (10).

The monopolar-bipolar diathermy dissection is the most common method used for removing tonsils in the United States (11). The main difference is using the electrocautery tip or a microdissection needle to separate the tonsil along with its capsule from surrounding tissue. It is believed, that the thermal damage to nearby tissue may cause more severe pain after surgery, however, conducted research shows no significant difference in patient-reported pain intensity between cold dissection and electrocautery dissection (5).

A harmonic scalpel was first used for tonsillectomy in the year 2000 (10). The main principle of this method is that the blade of the instrument vibrates at 55 kHz, thus it can cut tissues and coagulate vessels at the same time (12). Several studies report different and somewhat paradoxical results. When comparing the conventional cold dissection and the harmonic scalpel methods, patients experienced better

outcomes in terms of intraoperative bleeding and pain on the first postoperative day, however, there were no significant differences in other parameters, such as late postoperative bleeding and pain on the seventh postoperative day (5,10). Furthermore, the harmonic scalpel does not provide any major benefits over more conventional methods of tonsillectomy and is equivalent to electrocautery in postoperative pain outcomes (13). Moreover, the cost of surgery is higher when using the harmonic scalpel (12).

Coblation dissection is a relatively new method used for tonsillectomies. The main principle in this technique is that a radiofrequency bipolar electrical current is sent through a medium of normal saline, which results in a plasma field of highly ionized particles that break molecular bands between cells (14). This enables the ablation of tonsils at much lower temperatures than electrocautery dissection (15). Thus, it is believed to cause less damage to surrounding tissue. Studies show varying results when comparing coblation with other tonsillectomy techniques. Several authors claim that coblation tonsillectomy caused significantly less pain when compared with conventional techniques (16,17). Others, however found no significant difference in postoperative pain levels between different techniques (5).

Many new tonsillectomy techniques have been developed over the years and many studies have been performed comparing them, however, the results between them are varying and inconclusive. None of these surgical methods have been chosen as the best technique worldwide. It is necessary to conduct further research, to determine

which tonsillectomy technique provides the lowest level of pain post-surgery.

Medication for pain management

The main postoperative complaint is severe pain. Intense pain lasts several days and gradually reduces over the course of two weeks after tonsillectomy, thus the use of analgesics is highly recommended (6). Many studies are comparing several drugs and their combinations, however, there are no clear guidelines that would dictate the most optimal postoperative pain management after tonsillectomies. The most commonly used pain relief methods involve acetaminophen, nonsteroidal anti-inflammatory drugs, glucocorticoids, and opioid medication for pain.

Acetaminophen is one of the most widely used medicines worldwide. It exhibits clinically proven antipyretic and analgesic properties similar to nonsteroidal anti-inflammatory drugs (18). However, unlike NSAIDs, acetaminophen is a weak cyclooxygenase inhibitor, thus it has a weak anti-inflammatory effect, minimal gastrointestinal side effects, and has a small dose-dependent effect on thrombocyte function (18). On the other hand, nonsteroidal anti-inflammatory drugs, such as ibuprofen, have a higher effect on inflammation, but also a higher effect on platelet function, therefore it may lead to a higher risk of postoperative bleeding (19). Several studies have compared acetaminophen and ibuprofen, using the Visual Analogue Scale for measuring pain intensity after tonsillectomies. The authors found no significant difference in pain relief between the two medications, both provided adequate postoperative

analgesia (6). Other reports claim that ibuprofen provides better analgesia after surgery, but is associated with a higher risk of post-tonsillectomy hemorrhage (20). Therefore, having such diverse results in various studies, it is unclear which treatment approach would be optimal.

A single intraoperative dose of dexamethasone is known to reduce nausea and the risk of vomiting post-surgery (21). While conducting research, the authors noticed better pain management outcomes in patients that received dexamethasone during the procedure (21). Thus, further investigation was necessary to confirm glucocorticoid pain relief properties. Several studies analysed the effects of dexamethasone for patients after tonsillectomies. Because of the high post-tonsillectomy pain intensity, the analgesic effect did not reach clinical meaningfulness when dexamethasone was used alone, however, when included in multimodal treatment along with NSAIDs or acetaminophen, moderate pain relief effects have been achieved (22). Intraoperative dexamethasone usage is not related to a higher risk of post-tonsillectomy hemorrhage and no other adverse effects have been reported (21,22). Further research is needed to identify the best possible combination of medicine for optimal pain management.

There is not enough information to fully support the effective pain relief properties of opioid analgesics. Due to the opioid overdose crisis in the United States, opioid use has become stigmatized worldwide. One study compared oxycodone and dexamethasone as pain management options after tonsillectomies. Authors report, that oxycodone

significantly reduces the postoperative pain and provides better pain relief than dexamethasone (23). Studies report no respiratory depression complications or other adverse effects while administering oxycodone (23,24). Opioid analgesics might be a safe and adequate pain management method, however, further research is necessary, because the available literature is very limited.

Conclusion

Effective pain management after tonsillectomies is a wide area for research. The palatine tonsil removal is one of the most common surgeries performed in otorhinolaryngology, however, there are no clear guidelines for postoperative pain management. Patients experience severe pain during their recovery process and the administered analgesia is questionable. Many studies have been performed, analysing several pain-relieving medications, however, no clear consensus has been reached. Studies suggest, that no surgery method has a clear advantage over others in terms of lower postoperative pain. Available literature leaves much to be desired and further research must be conducted to make a firm conclusion on the best treatment approach for patients.

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