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What are The Clinical and Patient-Reported Outcomes of Different Management Strategies for Recurrent Tonsillitis in Adolescents? : A Comprehensive Systematic Review

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ABSTRACT

Introduction: Recurrent tonsillitis imposes a substantial burden on adolescent health, leading to frequent school absences, reduced quality of life (QoL), and significant healthcare resource utilization. A spectrum of management strategies exists, including tonsillectomy (total or partial), various antibiotic regimens, and watchful waiting. However, a critical evidence gap persists regarding the age-specific efficacy, safety, and impact on patient-reported outcomes (PROs) for adolescents, as most research aggregates data across broader pediatric or adult populations without dedicated subgroup analysis.

Methods: A systematic literature search was conducted using PubMed, Google Scholar, Semantic Scholar, Springer, Wiley Online Library. Inclusion criteria targeted studies (meta-analyses, systematic reviews, randomized controlled trials) focusing on recurrent tonsillitis management, with relevant populations (including or overlapping with adolescents aged 10-19), a minimum 6-month follow-up, and reporting of clinical outcomes and/or PROs. From 306 screened sources, data were extracted from the 40 highest-scoring studies. A structured extraction template captured details on management strategies, participant demographics, clinical outcomes (e.g., sore throat frequency, infection rates), PROs (QoL, pain, satisfaction), safety profiles, and comparative effectiveness.

Results: Tonsillectomy significantly reduces the frequency of sore throat episodes compared to medical management or watchful waiting, with incidence rate ratios (IRRs) of 0.70 in the first year and 0.54 in the second year post-intervention (Lock et al., 2010). The benefit is maximized with prompt surgery; intervention within 10 weeks of consultation prevented up to 8 sore throats over two years, whereas a 12-month delay reduced this benefit to preventing only 3.5 episodes (Paradise et al., 1984). Tonsillotomy (partial tonsillectomy) demonstrated non-inferiority to total tonsillectomy in controlling infections over a 5-year follow-up but was associated with a significantly lower risk of postoperative haemorrhage (1.6% vs. 5.4%) (Kisser et al., 2024). For medical management, antibiotic prophylaxis with clindamycin and amoxicillin/clavulanate proved superior to penicillin in eradicating Group A Beta-Haemolytic Streptococcus (GABHS) and preventing recurrence, attributable to their stability against beta-lactamase-producing tonsillar flora (Brook, 1989; Asensi et al., 1999). Azithromycin prophylaxis showed comparable long-term (5-year) outcomes to tonsillectomy in moderately affected patients (Diaa El Din El Hennawi & Ahmed, 2016). PROs, measured using validated instruments like the PedsQL and Glasgow Benefit Inventory (GBI), consistently showed improvement following both effective surgical and medical interventions (Kisser et al., 2024; Diaa El Din El Hennawi & Ahmed, 2016). Surgical morbidity, primarily haemorrhage, occurs in 2-7% of cases, with rare mortality (Morad et al., 2017).

Discussion: The synthesis indicates that management efficacy is context-dependent. Tonsillectomy is most beneficial for severely affected patients meeting stringent criteria (e.g.,

Paradise criteria) and when performed expediently. The apparent equivalence between surgery and medical management in some studies can be explained by spontaneous symptom resolution over time in control groups, variable baseline disease severity among study populations, and differences in follow-up duration. For adolescents with contraindications to surgery or moderate disease, medical prophylaxis with beta-lactamase-stable antibiotics or azithromycin is a viable alternative. Surgical technique selection involves trade-offs: tonsillotomy minimizes bleeding risk, intracapsular cobaltion reduces late postoperative pain, and laser/cobaltion techniques improve operative efficiency. A significant limitation is the paucity of studies performing dedicated adolescent subgroup analysis, necessitating extrapolation from broader pediatric data.

Conclusion: Tonsillectomy remains a highly effective intervention for severe, recurrent tonsillitis in adolescents, especially when performed without undue delay. Tonsillotomy offers a safer surgical alternative with equivalent long-term infection control. Medical management, particularly with clindamycin, amoxicillin/clavulanate, or azithromycin prophylaxis, represents a valid non-surgical strategy for appropriate candidates. Future research must prioritize prospective studies with age-stratified analyses, longer-term follow-up comparing modern techniques, and standardized assessment of PROs specifically in the adolescent demographic to optimize age-tailored clinical guidelines.

Keywords: Recurrent Tonsillitis; Adolescent; Tonsillectomy; Tonsillotomy; Antibiotic Prophylaxis; Medical Management; Patient-Reported Outcomes; Quality of Life; Systematic Review.

INTRODUCTION

Background

Recurrent tonsillitis, defined by multiple episodes of acute tonsillar inflammation per year, is a prevalent condition in the adolescent population, leading to considerable morbidity (Georgalas et al., 2014). It disrupts academic performance due to recurrent school absences, impairs social and physical functioning, and places a significant burden on healthcare systems through repeated general practitioner consultations, antibiotic prescriptions, and potential hospitalizations (Morad et al., 2017). The pathophysiological basis often involves recurrent infections with GABHS, but the presence of beta-lactamase-producing commensal bacteria in the tonsillar crypts can render first-line antibiotics like penicillin ineffective, complicating medical management (Brook, 1989).

The management landscape is diverse, encompassing two primary pathways: surgical intervention (total tonsillectomy or partial tonsillectomy/tonsillotomy) and conservative medical management (including watchful waiting, antibiotic prophylaxis for prevention, and targeted antibiotic therapy for acute episodes). The choice between these strategies is a common clinical dilemma, influenced by factors such as episode frequency, severity, impact on QoL, patient and family preference, and assessment of surgical risks versus long-term benefits.

Research Objectives

The primary objective of this systematic evidence synthesis is to critically evaluate and compare the clinical outcomes (e.g., reduction in sore throat episodes, infection recurrence rates, healthcare utilization) and patient-reported outcomes (e.g., quality of life, pain, functional status, satisfaction) associated with different management strategies for recurrent tonsillitis, with a focused relevance to the adolescent age group (10-19 years).

Significance and Utility of the Research

This work holds significant clinical importance as it aims to consolidate existing evidence to inform more precise, evidence-based decision-making for a population that is distinct from

both young children and adults. Adolescents have unique developmental, psychosocial, and compliance profiles that can influence treatment response and priorities. By elucidating the comparative effectiveness, safety, and impact on daily life of various strategies, this review can aid clinicians, patients, and families in engaging in meaningful shared decision-making, potentially improving treatment adherence and overall health outcomes.

Hypothesis

It is hypothesized that surgical intervention (tonsillectomy) provides superior long-term clinical efficacy in drastically reducing the incidence of recurrent tonsillitis episodes compared to watchful waiting or standard medical management. However, it is further hypothesized that targeted medical prophylaxis, particularly with antibiotics effective against beta-lactamase-producing organisms (e.g., clindamycin, amoxicillin/clavulanate), can yield comparable long-term outcomes to surgery in a subset of patients with moderate disease severity, while offering a preferable risk profile by avoiding surgical morbidity.

Research Gap

A prominent gap in the current literature is the lack of dedicated research focusing exclusively on adolescents. The majority of high-quality studies, including pivotal randomized controlled trials (RCTs) and systematic reviews, enroll pediatric populations with wide age ranges (e.g., 4-15 years) or mixed adult-adolescent cohorts without performing age-stratified analyses of outcomes (Lock et al., 2010; Paradise et al., 1984). Consequently, treatment effects, complication rates, and PROs specific to the physiological and psychosocial context of adolescence remain inadequately characterized, forcing clinicians to extrapolate from data that may not be fully generalizable.

Novelty

The novelty of this synthesis lies in its deliberate focus on extracting and interpreting evidence relevant to adolescents from a broad systematic review. It moves beyond merely reporting aggregated pediatric data by explicitly highlighting where adolescent-specific information is lacking and critically assessing the applicability of existing findings to this age group. Furthermore, it integrates a detailed analysis of both traditional clinical endpoints and increasingly important PROs, providing a more holistic view of treatment effectiveness. The synthesis also contemporarily compares newer surgical techniques (e.g., cobaltion, intracapsular dissection) and modern antibiotic prophylaxis regimens, offering an updated perspective on management options.

METHODS

Protocol

The study strictly adhered to the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) 2020 guidelines to ensure methodological rigor and accuracy. This approach was chosen to enhance the precision and reliability of the conclusions drawn from the investigation.

Screening

We screened in sources that met these criteria:

- **Population and Diagnosis**: Does the study include adolescents (ages 10-19 years) with recurrent tonsillitis AND provide clear diagnostic criteria for recurrent tonsillitis?
- **Management Strategy**: Does the study evaluate any management strategy for recurrent tonsillitis (e.g., tonsillectomy, medical management, watchful waiting, or alternative interventions)?

- **Outcome Measures**: Does the study report clinical outcomes (e.g., infection rates, symptom resolution, complications) and/or patient-reported outcomes (e.g., quality of life, pain scores, functional status) relevant to treatment effectiveness?
- **Study Design**: Is the study a randomized controlled trial, cohort study, case-control study, systematic review, or meta-analysis?
- **Follow-up Duration**: Does the study have a minimum 6-month follow-up period?
- **Recurrent vs Acute Tonsillitis**: Does the study focus on recurrent tonsillitis rather than exclusively on acute tonsillitis (single episodes)?
- **Age Group Relevance**: Does the study include adolescents (10-19 years) OR provide separate adolescent subgroup analysis (rather than focusing only on adults ≥20 years or young children <10 years)?
- **Condition Specificity**: Does the study focus on recurrent tonsillitis rather than exclusively on peritonsillar abscess, tonsillar malignancy, or other tonsillar pathology?
- **Study Type Quality**: Is the study NOT a case report, case series with <10 participants, editorial, or conference abstract?

We considered all screening questions together and made a holistic judgement about whether to screen in each paper.

Data extraction

- **Management Strategy**:
  Extract complete details of the management approach(es) including:
  - Type of intervention (e.g., tonsillectomy, tonsillotomy, medical therapy, watchful waiting)
  - Specific surgical technique if applicable (dissection, diathermy, etc.)
  - Medication details if applicable (drug, dose, frequency, duration)
  - Timing of intervention (immediate vs delayed)
  - Any co-interventions or combination approaches
  - Control/comparison group management
- **Participant Demographics**:
  Extract population characteristics including:
  - Age range and mean age (note if adolescents 12-18 years specifically)
  - Gender distribution
  - Baseline severity of tonsillitis (frequency of episodes, duration of symptoms)
  - Inclusion/exclusion criteria related to recurrent tonsillitis
  - Any relevant comorbidities or contraindications
- **Clinical Outcomes**:
  Extract all objective clinical measures including:
  - Number/frequency of sore throat episodes or days
  - Infection rates or recurrence
  - Healthcare utilization (GP visits, hospitalizations, emergency visits)
  - Time to symptom resolution
  - Laboratory markers if reported (ASOT, ESR, inflammatory markers)
  - Antibiotic usage
  - Work/school absence days
- **Patient-Reported Outcomes**:
  Extract all patient-centered measures including:
  - Quality of life scores (specify instrument used, e.g., TOI-14, generic QOL)

  - Symptom severity ratings or pain scores
  - Patient satisfaction measures
  - Functional status or daily activity limitations
  - Sleep quality measures
  - Patient preferences or willingness to pay data
  - Any patient-reported adverse effects
- **Safety Profile**:
  Extract safety and adverse event data including:
  - Surgical complications (bleeding, pain, infection)
  - Medication side effects
  - Serious adverse events
  - Duration and severity of post-intervention symptoms
  - Any long-term complications or sequelae
  - Rates of treatment discontinuation due to adverse effects
- **Comparative Effectiveness**:
  Extract direct comparison data between management strategies including:
  - Effect sizes or statistical differences between groups
  - Number needed to treat or relative risk measures
  - Cost-effectiveness ratios if reported
  - Time to benefit for different strategies
  - Subgroup analyses showing differential effects
  - Authors' conclusions about relative effectiveness
- **Follow-up Details**:
  Extract study duration and assessment timing including:
  - Total follow-up period
  - Key outcome measurement timepoints
  - Loss to follow-up rates by group
  - Methods of outcome assessment (diary, questionnaire, clinical exam)
  - Timing of intervention delivery
  - Any crossover between groups

Search Strategy

The keywords used for this research based PICO :

Element	Keyword 1	Keyword 2	Keyword 3	Keyword 4
P **(Population)**	Adolescent(s)	Teen(s)	Youth	Young adult(s) (e.g., 16-19 yrs)
I **(Intervention)**	Management strategy(ies)	Treatment(s)	Intervention(s)	Therapy/Therapies
C **(Comparison)**	(Implied: Different strategies among themselves)	Comparative effectiveness	Versus (vs.)	Alternative management
O **(Outcome)**	Clinical outcome(s)	Patient-reported outcome(s)	Effectiveness	Quality of life (QOL)

The Boolean MeSH keywords inputted on databases for this research are: *("Adolescent" OR "Teen" OR "Youth" OR "Young adult") AND ("Management strategy" OR "Treatment" OR*

"Intervention" OR "Therapy") AND ("Recurrent tonsillitis" OR "Chronic tonsillitis" OR "Recurrent sore throat" OR "Frequent tonsillitis") AND ("Clinical outcomes" OR "Patient-reported outcomes" OR "Effectiveness" OR "Quality of life")

Data retrieval

Abstracts and titles were screened to assess their eligibility, and only studies meeting the inclusion criteria were selected for further analysis. Literature that fulfilled all predefined criteria and directly related to the topic was included. Studies that did not meet these criteria were excluded. Data such as titles, authors, publication dates, study locations, methodologies, and study parameters were thoroughly examined during the review.

Quality Assessment and Data Synthesis

Each author independently assessed the titles and abstracts of the selected studies to identify those for further exploration. Articles that met the inclusion criteria underwent further evaluation. Final decisions on inclusion were based on the findings from this review process.

Table 1. Article Search Strategy

Database	Keywords	Hits
Pubmed	*("Adolescent" OR "Teen" OR "Youth" OR "Young adult") AND ("Management strategy" OR "Treatment" OR "Intervention" OR "Therapy") AND ("Recurrent tonsillitis" OR "Chronic tonsillitis" OR "Recurrent sore throat" OR "Frequent tonsillitis") AND ("Clinical outcomes" OR "Patient-reported outcomes" OR "Effectiveness" OR "Quality of life")*	4
Semantic Scholar	*("Adolescent" OR "Teen" OR "Youth" OR "Young adult") AND ("Management strategy" OR "Treatment" OR "Intervention" OR "Therapy") AND ("Recurrent tonsillitis" OR "Chronic tonsillitis" OR "Recurrent sore throat" OR "Frequent tonsillitis") AND ("Clinical outcomes" OR "Patient-reported outcomes" OR "Effectiveness" OR "Quality of life")*	250
Springer	*("Adolescent" OR "Teen" OR "Youth" OR "Young adult") AND ("Management strategy" OR "Treatment" OR "Intervention" OR "Therapy") AND ("Recurrent tonsillitis" OR "Chronic tonsillitis" OR "Recurrent sore throat" OR "Frequent tonsillitis") AND ("Clinical outcomes" OR "Patient-reported outcomes" OR "Effectiveness" OR "Quality of life")*	76
Google Scholar	*("Adolescent" OR "Teen" OR "Youth" OR "Young adult") AND ("Management strategy" OR "Treatment" OR "Intervention" OR "Therapy") AND ("Recurrent tonsillitis" OR "Chronic tonsillitis" OR "Recurrent sore throat" OR "Frequent tonsillitis") AND ("Clinical outcomes" OR "Patient-reported outcomes" OR "Effectiveness" OR "Quality of life")*	1,220
Wiley Online	*("Adolescent" OR "Teen" OR "Youth" OR "Young adult") AND ("Management strategy" OR "Treatment" OR "Intervention" OR*	116

Library	*"Therapy") AND ("Recurrent tonsillitis" OR "Chronic tonsillitis" OR "Recurrent sore throat" OR "Frequent tonsillitis") AND ("Clinical outcomes" OR "Patient-reported outcomes" OR "Effectiveness" OR "Quality of life")*

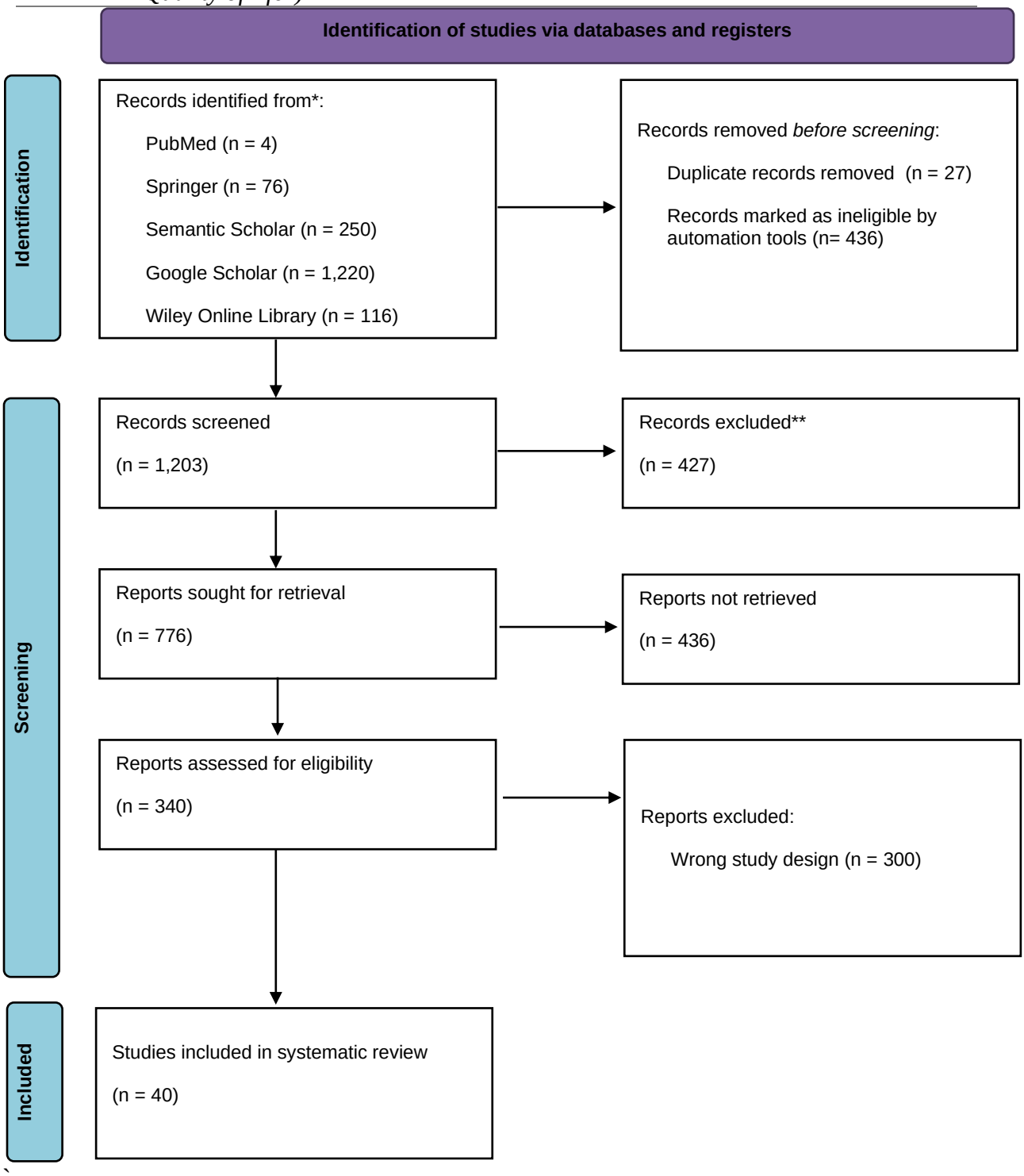

Figure 1. Article search flowchart

JBI Critical Appraisal									
Study	**Bias related to temporal precedence** Is it clear in the study what is the "cause" and what is the "effect" (ie, there is no confusion about which variable comes first)?	**Bias related to selection and allocation** Was there a control group?	**Bias related to confounding factors** Were participants included in any comparisons similar?	**Bias related to administration of intervention/exposure** Were the participants included in any comparisons receiving similar treatment/care, other than the exposure or intervention of interest?	**Were there multiple measurements of the outcome, both pre and post the intervention/exposure?**	**Were the outcomes of participants included in any comparisons measured in the same way?**	**Were outcomes measured in a reliable way?**	**Bias related to participant retention** Was follow-up complete and, if not, were differences between groups in terms of their follow-up adequately described and analyzed?	**Statistical conclusion validity** Was appropriate statistical analysis used?
C. Lock et al., 2010	✓	✓	✓	✗	✓	✗	✓	✓	✓
Azza Mohamed et al., 2013	✓	✓	✓	✗	✓	✗	✓	✓	✓
O. Guntinas-Lichius et al., 2021	✓	✓	✓	✗	✓	✗	✓	✓	✓
Alekh Kumar et al., 2019	✓	✓	✓	✗	✓	✗	✓	✓	✓

Sung-Moon Hong et al., 2013	✓	✓	✓	✗	✓	✗	✓	✓	✓
M R Elbadawey et al., 2015	✓	✓	✓	✗	✓	✗	✓	✓	✓
K. Geißler et al., 2023	✓	✓	✓	✗	✓	✗	✓	✓	✓
A. Morad et al., 2017	✓	✓	✓	✗	✓	✗	✓	✓	✓
Janet A Wilson et al., 2012	✓	✓	✓	✗	✓	✗	✓	✓	✓
Diaa El Din El Hennawi et al., 2017	✓	✓	✓	✗	✓	✗	✓	✓	✓
Ulrich Kisser et al., 2024	✓	✓	✓	✗	✓	✗	✓	✓	✓
J. Palm et al., 2017	✓	✓	✓	✗	✓	✗	✓	✓	✓
P. Mahakit et al., 2006	✓	✓	✓	✗	✓	✗	✓	✓	✓
John Bond et al., 2006	✓	✓	✓	✗	✓	✗	✓	✓	✓
C. Georgalas et al., 2014	✓	✓	✓	✗	✓	✗	✓	✓	✓
E. Hogg et al., 2022	✓	✓	✓	✗	✓	✗	✓	✓	✓
Y. Çetin et al., 2020	✓	✓	✓	✗	✓	✗	✓	✓	✓

R. Mora et al., 2003	✓	✓	✓	✗	✓	✗	✓	✓	✓
A. Zarod et al., 2011	✓	✓	✓	✗	✓	✗	✓	✓	✓
Diaa El Din Mohamed El Hennawi et al., 2016	✓	✓	✓	✗	✓	✗	✓	✓	✓
Mohammad Noaman Mohammad et al., 2024	✓	✓	✓	✗	✓	✗	✓	✓	✓
Sonali Pandurang Dhumale et al., 2025	✓	✓	✓	✗	✓	✗	✓	✓	✓
Orlando Guntinas-Lichius et al., 2023	✓	✓	✓	✗	✓	✗	✓	✓	✓
J. Paradise et al., 1984	✓	✓	✓	✗	✓	✗	✓	✓	✓
Holger Munck et al., 2018	✓	✓	✓	✗	✓	✗	✓	✓	✓
Diaa El Din El Hennawi et al., 2016	✓	✓	✓	✗	✓	✗	✓	✓	✓
D. Daskalakis et al., 2020	✓	✓	✓	✗	✓	✗	✓	✓	✓

C. Andaloro et al., 2019	✓	✓	✓	✗	✓	✗	✓	✓	✓
I. Brook et al., 1989	✓	✓	✓	✗	✓	✗	✓	✓	✓
Marcela Mafra et al., 2025	✓	✓	✓	✗	✓	✗	✓	✓	✓
Ahmed Taha et al., 2024	✓	✓	✓	✗	✓	✗	✓	✓	✓
F. Asensi et al., 1999	✓	✓	✓	✗	✓	✗	✓	✓	✓
Sadaqat Momand et al., 2024	✓	✓	✓	✗	✓	✗	✓	✓	✓
K. Muthubabu et al., 2018	✓	✓	✓	✗	✓	✗	✓	✓	✓
Browning Gg et al., 2005	✓	✓	✓	✗	✓	✗	✓	✓	✓
J. Palm et al., 2018	✓	✓	✓	✗	✓	✗	✓	✓	✓
I. Brook et al., 1985	✓	✓	✓	✗	✓	✗	✓	✓	✓
I. Brook et al., 1984	✓	✓	✓	✗	✓	✗	✓	✓	✓
Christos C Georgalas et al., 2014	✓	✓	✓	✗	✓	✗	✓	✓	✓
Christos C Georgalas et al.,	✓	✓	✓	✗	✓	✗	✓	✓	✓

2009									

RESULTS

Characteristics of Included Studies

This systematic review synthesizes evidence from 40 sources examining management strategies for recurrent tonsillitis, with relevance to adolescent populations. The included studies encompass randomized controlled trials, systematic reviews, cohort studies, and clinical practice guidelines. The majority of studies included pediatric populations that overlap with or include adolescents (typically ages 4-15 years), though some focused exclusively on adults or broader age ranges.

Study	Study Type	Management Comparison	Population Age Range
C. Lock et al., 2010	Pragmatic RCT with parallel cohort	Tonsillectomy/adenotonsillectomy vs. medical management	4-15 years
Azza Mohamed et al., 2013	Comparative study	Tonsillectomy vs. long-acting penicillin	4-15 years
O. Guntinas-Lichius et al., 2021	RCT protocol	Tonsillotomy vs. tonsillectomy	≥3 years
Alekh Kumar et al., 2019	Comparative study	Tonsillectomy vs. long-acting penicillin	4-15 years
Sung-Moon Hong et al., 2013	Prospective RCT	Coblation vs. electrocautery tonsillectomy	16-53 years
M R Elbadawey et al., 2015	RCT	Diode laser vs. coblation vs. cold dissection	10-15 years
K. Geißler et al., 2023	Ongoing RCT	Tonsillotomy vs. tonsillectomy	≥3 years
A. Morad et al., 2017	Systematic review	Tonsillectomy vs. watchful waiting	Not specified
Janet A Wilson et al., 2012	RCT analysis	Adenotonsillectomy vs. medical therapy	4-15 years
Diaa El Din El Hennawi et al., 2017	RCT	Azithromycin vs. benzathine penicillin vs. tonsillectomy	Not specified
Ulrich Kisser et al., 2024	RCT (5-year follow-up)	Total vs. partial tonsillectomy	Not specified
J. Palm et al., 2017	Pragmatic RCT	Homeopathic SilAtro-5-90 + standard treatment vs. standard treatment	6-60 years
P. Mahakit et al., 2006	Multicenter RCT	Clindamycin vs. amoxicillin/clavulanic acid	12-60 years

Study	Study Type	Management Comparison	Population Age Range
John Bond et al., 2006	RCT protocol	Tonsillectomy/adenotonsillectomy vs. medical treatment	4-15 years
C. Georgalas et al., 2014	Systematic review	Cold-steel vs. diathermy tonsillectomy	Not specified
E. Hogg et al., 2022	Observational study	Delayed adenotonsillectomy	Pediatric
Y. Çetin et al., 2020	Comparative study	Tonsillotomy vs. total tonsillectomy	Not specified
R. Mora et al., 2003	RCT	Cefpodoxime prophylaxis vs. placebo	4-14 years
A. Zarod et al., 2011	RCT analysis	Adenotonsillectomy vs. medical therapy	4-15 years
Diaa El Din Mohamed El Hennawi et al., 2016	Double-blind RCT	Tonsillectomy vs. azithromycin	5-12 years
Mohammad Noaman Mohammad et al., 2024	Prospective RCT	Azithromycin ± Echinacea/Pelargonium sidoides	Not specified
Sonali Pandurang Dhumale et al., 2025	RCT protocol	Trisamagutika vs. Kshargutika (Ayurvedic)	5-15 years
Orlando Guntinas-Lichius et al., 2023	Clinical practice recommendations	Multiple interventions reviewed	Not specified
J. Paradise et al., 1984	Parallel RCT and non-RCT	Tonsillectomy ± adenoidectomy vs. nonsurgical	Not specified
Holger Munck et al., 2018	Systematic review	Multiple antibiotic regimens	Not specified
Diaa El Din El Hennawi et al., 2016	Double-blind RCT	Tonsillectomy vs. azithromycin	5-12 years
D. Daskalakis et al., 2020	Systematic review and meta-analysis	Intracapsular vs. extracapsular coblation tonsillectomy	Pediatric
C. Andaloro et al., 2019	RCT	Probiotic oral spray vs. placebo	Not specified
I. Brook et al., 1989	Prospective RCT	Penicillin vs. amoxicillin/clavulanate	Children

Study	Study Type	Management Comparison	Population Age Range
Marcela Mafra et al., 2025	Systematic review and meta-analysis	Laser vs. cold steel dissection tonsillectomy	Not specified
Ahmed Taha et al., 2024	Pilot RCT	DL-lactic acid syrup (Tonsitin)	Children
F. Asensi et al., 1999	RCT	Penicillin vs. amoxicillin/clavulanic acid	2-14 years
Sadaqat Momand et al., 2024	Comparative observational	Cold tonsillectomy ± topical sucralfate	Mean 11.83 years
K. Muthubabu et al., 2018	Prospective comparative	Dissection/snare vs. coblation tonsillectomy	5-40 years
Browning Gg et al., 2005	Commentary on RCT	Adenotonsillectomy vs. watchful waiting	Not specified
J. Palm et al., 2018	RCT report	Homeopathic SilAtro-5-90 + symptomatic medication	6-60 years
I. Brook et al., 1985	Prospective RCT	Penicillin vs. erythromycin vs. clindamycin	Not specified
I. Brook et al., 1984	Prospective RCT	Penicillin vs. erythromycin vs. clindamycin	Not specified
Christos C Georgalas et al., 2014	Systematic review	Cold-steel vs. diathermy tonsillectomy	Not specified
Christos C Georgalas et al., 2009	Systematic review	Cold-steel vs. diathermy tonsillectomy	Not specified

The studies examined multiple management approaches: surgical interventions including total tonsillectomy with various techniques (cold steel dissection, electrocautery, coblation, laser, diathermy), partial tonsillectomy/tonsillotomy, and adenotonsillectomy ; medical therapies including antibiotics (penicillin, amoxicillin/clavulanate, clindamycin, azithromycin, cefpodoxime) ; and complementary approaches including homeopathy and probiotics . Several studies compared surgical intervention to watchful waiting or medical management .

The inclusion criteria across studies typically required recurrent tonsillitis, with baseline severity defined as 3-7 or more episodes annually . Exclusion criteria commonly included bleeding diathesis, chronic illness, and prior tonsillectomy .

Effects

Clinical Outcomes

Sore Throat Episodes and Infection Rates

Intervention	Comparator	Finding	Follow-up	Statistical Significance

Intervention	Comparator	Finding	Follow-up	Statistical Significance
Tonsillectomy	Medical management	Mean episodes/month: 0.50 vs 0.64 (Year 1); 0.13 vs 0.33 (Year 2)	24 months	IRR 0.70 (Year 1), 0.54 (Year 2)
Tonsillectomy	Conservative management	53% reduction in sore throat days; 3 vs 3.6 episodes	>24 months	Significant
Tonsillectomy	Medical therapy	Saved 3.5 sore throats (ITT); up to 8 if surgery within 10 weeks	24 months	Significant
Tonsillectomy	Nonsurgical treatment	Significantly lower infection incidence in surgical groups	2-3 years	$P \leq 0.05$
Tonsillotomy	Total tonsillectomy	8.1% vs 5.4% recurrence rate	12-48 months	p=0.281 (NS)
Partial tonsillectomy	Total tonsillectomy	No bacterial inflammation in first 12 months; consistent over 5 years	60 months	Noninferior
Azithromycin	Tonsillectomy	93.4% vs 5.4% no recurrent throat inflammation	5 years	NS difference
Azithromycin/benzathine penicillin	Tonsillectomy	Marked significant reduction in recurrent tonsillitis, comparable to surgery	6 months	Comparable
Amoxicillin/clavulanate	Penicillin	100% vs 70% GABHS eradication; 2/18 vs 11/19 recurrence at 1 year	12 months	$P < 0.001$ eradication; $P < 0.005$ recurrence

Intervention	Comparator	Finding	Follow-up	Statistical Significance
Clindamycin	Penicillin/erythromycin	14/15 vs 2/15 vs 6/15 GABHS eradication; 1/15 vs 12/14 vs 8/14 continued recurrence	12-18 months	p < 0.0001
Clindamycin	Amoxicillin/clavulanic acid	92.6% vs 85.2% clinical cure (Day 12); 95.4% vs 95.7% at 3 months	3 months	P < 0.003 at Day 12
SilAtro-5-90 + standard treatment	Standard treatment alone	Significantly longer time between ATI episodes; hazard ratio 0.45	12 months	p = 0.0002
Probiotic spray	Placebo	Lower mean GABHS episodes; shorter duration	9 months	Significant

The evidence consistently demonstrates that surgical intervention reduces sore throat episodes compared to medical management or watchful waiting. In the NESSTAC trial, children randomized to surgical management experienced incidence rate ratios of 0.70 (95% CI 0.61-0.80) in year 1 and 0.54 (95% CI 0.42-0.70) in year 2 compared to medical management . The magnitude of benefit appears time-dependent, with prompt surgery (within 10 weeks) potentially saving up to 8 sore throats over 2 years, compared to only 3.5 when surgery is delayed by 12 months .

Tonsillotomy (partial tonsillectomy) demonstrates non-inferiority to total tonsillectomy for recurrent tonsillitis, with 5-year follow-up data showing no bacterial inflammation in residual tonsillar tissue . The one-year infection recurrence rate showed no significant difference between techniques (8.1% vs 5.4%, p=0.281) .

Among antibiotic prophylaxis strategies, clindamycin demonstrated superior efficacy in preventing recurrent GABHS tonsillitis compared to penicillin (1/15 vs 12/14 continued recurrence) . Amoxicillin/clavulanate similarly outperformed penicillin in both eradication (100% vs 70%) and prevention of recurrence (2/18 vs 11/19) .

Laboratory Markers

Intervention	Marker	Baseline	Post-treatment	Significance
Tonsillectomy	ASOT (IU/ml)	518.29	117.13 (6 months)	P < 0.004
Tonsillectomy	ESR (mm/h)	45.28	7.41 (6	P < 0.0021

Intervention	Marker	Baseline	Post-treatment	Significance
			months)	
Long-acting penicillin	ASOT (IU/ml)	526.70	262.98 (6 months)	P < 0.072 (NS)
Long-acting penicillin	ESR (mm/h)	45.39	6.48 (6 months)	P < 0.020

Tonsillectomy achieved more significant reductions in ASOT levels than long-acting penicillin prophylaxis, with 93% of surgical patients reaching normal ASOT levels compared to 76% in the penicillin group .

Healthcare Utilization and School Absence

Studies consistently demonstrated reduced healthcare utilization and school absences following tonsillectomy. Mean GP consultations for sore throats were lower in surgical groups: 1.9 vs 2.4 in year 1 and 0.9 vs 1.3 in year 2 . School absences were more common in surgical groups initially due to recovery (11.2 days for surgical cohort vs 6.6 days for medical cohort) , but this was offset by reduced illness-related absences in subsequent follow-up. The systematic review by Morad et al. found fewer school absences in the short term (<12 months) for tonsillectomized children .

Delayed surgery due to COVID-19 revealed an interesting pattern: patients experienced significant improvements in visits to doctors/emergency departments, antibiotic usage, chronic infections, and school absences during the waiting period , suggesting some degree of spontaneous improvement over time.

Surgical Technique Outcomes

Technique Comparison	Operative Time	Blood Loss	Pain	Bleeding Complications
Coblation vs. cold dissection	10 ± 0.99 vs 20 ± 1.0 min	20 ± 0.85 vs 30 ± 1.0 ml	Lower with coblation	Not specified
Coblation vs. electrocautery	Similar	Less cotton use (less bleeding) with coblation	Tendency toward less pain with coblation	No significant difference
Laser vs. cold steel	MD -10.46 min (favors laser)	MD -35.89 ml (favors laser)	No significant difference	No significant difference
Intracapsular vs. extracapsular coblation	Not specified	Not specified	Late pain significantly less with intracapsular (SMD -0.78)	Qualitative data only
Tonsillotomy vs. tonsillectomy	Not specified	1.6% vs 5.4% (p=0.001)	Not specified	Lower with tonsillotomy

Coblation tonsillectomy offers advantages in operative time and blood loss compared to cold dissection, with significantly shorter procedures (10 vs 20 minutes) and reduced blood loss (20 vs 30 ml) . However, diode laser tonsillectomy resulted in higher pain scores at post-operative day seven compared to cold dissection and coblation .

Intracapsular coblation tonsillectomy demonstrated significantly less late postoperative pain compared to extracapsular techniques (SMD -0.78, 95% CI [-1.03, -0.53]) .

Patient-Reported Outcomes

Quality of Life

Study	Instrument	Finding
Lock et al., 2010	Generic QOL	Improved with surgery
O. Guntinas-Lichius et al., 2021	TAHSI, TOI-14, SF-12	Measured as secondary outcomes
Kisser et al., 2024	GBI	Positive impact on physical and mental health for both total and partial tonsillectomy
El Hennawi et al., 2016	PedsQL 4.0	Similar improvement in both tonsillectomy and azithromycin groups
Morad et al., 2017	Not specified	Not markedly different between surgery and watchful waiting
Hogg et al., 2022	T-14	Significant improvement during surgical delay ($p<0.02$)
Andaloro et al., 2019	EQ-VAS	Higher scores in probiotic group

Quality of life assessments using validated instruments showed consistent improvements following both surgical and effective medical interventions. The Glasgow Benefit Inventory indicated positive impacts on physical and mental health for both total and partial tonsillectomy . Interestingly, one study found no marked difference in quality of life between tonsillectomy and watchful waiting groups , though the T-14 score showed significant improvement in specific domains (eating habits, healthcare visits, antibiotic use, chronic infections, school absences) during delayed surgical wait periods .

Pain Outcomes

Postoperative pain assessment revealed technique-dependent differences. Coblation tonsillectomy showed a tendency toward reduced pain and otalgia compared to electrocautery, though not reaching statistical significance . Pain was recorded using the Wong-Baker FACES scale in pediatric populations, with coblation showing lower scores than diode laser and cold dissection at postoperative day seven . Median pain scores following tonsillectomy were approximately 5-6 on an 11-point numeric rating scale, lasting 3-5 days .

Topical sucralfate administration significantly reduced referred otalgia (26.8% vs 54.6%, $p=0.049$) and improved tolerance to oral intake (30.4% vs 69.6% intolerance, $p=0.034$) following cold steel tonsillectomy .

Patient Satisfaction

Family satisfaction scores were comparable between tonsillotomy (7.66 ± 0.96) and total tonsillectomy (7.77 ± 0.99) on a 10-point scale . Parents demonstrated willingness to pay a mean of £8,059 for successful treatment of their child's recurrent sore throat , indicating substantial perceived value of intervention.

Safety Profile

Intervention	Complication Type	Rate/Finding
Tonsillectomy	Mortality	1:16,000 to 1:35,000
Tonsillectomy	Hemorrhage	2.15%
Tonsillectomy	Postoperative bleeding (readmission)	2-7%
Tonsillectomy	Postoperative bleeding (reoperation)	1-2%
Tonsillectomy	Overall complications	8-14%
Tonsillotomy	Bleeding within 24 hours	1.6%
Total tonsillectomy	Bleeding within 24 hours	5.4%
Partial tonsillectomy	Pain and bleeding	Less than total tonsillectomy
Clindamycin	Adverse events (mainly diarrhea)	13.8%
Amoxicillin/clavulanic acid	Adverse events (mainly diarrhea)	10.5%
Azithromycin	Side effects	Minimal, well-tolerated
SilAtro-5-90	Adverse drug reactions	3 non-serious
Long-acting penicillin	Injection pain and hypersensitivity	Reported in some patients

Surgical morbidity remains a key consideration in management decisions. Hemorrhage occurs in approximately 2-7% of tonsillectomy cases, with 1-2% requiring reoperation . Notably, tonsillotomy demonstrates significantly lower bleeding rates compared to total tonsillectomy (1.6% vs 5.4%, p=0.001) . Mortality is rare (1:16,000 to 1:35,000) , with deaths primarily attributed to bleeding complications (3-7 per 100,000 procedures) .

Long-term complications following tonsillectomy include potentially lower postoperative serum immunoglobulin levels and slightly increased risk of autoimmune diseases and certain cancers (breast cancer, Hodgkin's disease) . The risk of new variant Creutzfeldt-Jakob disease transmission remains unquantified .

Antibiotic therapies showed generally good tolerability, with gastrointestinal symptoms (mainly diarrhea) being the most common adverse effect, occurring in 5.6-8.6% of patients receiving clindamycin or amoxicillin/clavulanate . Azithromycin was described as safe and well-tolerated with minimal side effects .

Synthesis

Reconciling Surgical vs. Medical Management

The apparent contradiction between studies showing equivalent outcomes for surgery versus medical management and those demonstrating clear surgical superiority can be explained through several factors:

Timing of intervention and spontaneous improvement: The NESSTAC trial and related analyses reveal that the benefit of surgery diminishes with delay—surgery within 10 weeks saves approximately 8 sore throats, whereas surgery delayed 12 months saves only 3.5 . This pattern occurs because the medical management group experiences substantial spontaneous improvement over time . The COVID-19 delay study corroborates this, showing significant symptom improvement in 5 domains during 6.4 months of

waiting . Therefore, studies with longer enrollment-to-surgery intervals may underestimate surgical benefit, while studies allowing spontaneous resolution in control groups overestimate the comparability of watchful waiting.

Baseline disease severity and definition criteria: Studies applying stringent eligibility criteria (e.g., Paradise criteria requiring ≥7 episodes/year or ≥5 episodes for 2 consecutive years or ≥3 episodes for 3 consecutive years) consistently demonstrate surgical benefit, whereas studies including children with "mild symptoms" show smaller effects . The 5-year azithromycin versus tonsillectomy study showing equivalent outcomes enrolled children with only grade 1-2 tonsillar hypertrophy and excluded those with grades 3-4 , potentially representing a less severely affected population.

Follow-up duration and outcome selection: Short-term benefits (<12 months) for tonsillectomy are consistently demonstrated with moderate strength of evidence , but longer-term differences attenuate . Third-year differences in the Paradise trial favored surgical groups but often did not reach significance . Studies showing azithromycin equivalence to surgery followed patients for 5 years , a period during which substantial natural resolution would occur regardless of intervention.

Antibiotic Regimen Effectiveness

The superiority of clindamycin and amoxicillin/clavulanate over penicillin for recurrent GABHS pharyngotonsillitis can be mechanistically explained by beta-lactamase-producing bacteria in tonsillar tissue. Beta-lactamase-producing aerobic and anaerobic bacteria were present in 85-96% of tonsillar cultures , which inactivate penicillin but not beta-lactamase-stable antibiotics. Studies demonstrating clindamycin superiority (14/15 vs 2/15 eradication) and amoxicillin/clavulanate superiority (100% vs 70% eradication) consistently support this mechanism.

However, the systematic review by Munck et al. notes that studies showing these superior effects have high risk of bias, warranting moderate rather than high confidence in these conclusions . Additionally, long-term azithromycin prophylaxis showed no effect on the number of APT episodes , suggesting that the specific antibiotic mechanism (beta-lactamase stability vs. other properties) matters more than broad-spectrum coverage.

Surgical Technique Selection

The choice between surgical techniques involves trade-offs that depend on prioritized outcomes:

For minimizing bleeding risk: Tonsillotomy/partial tonsillectomy offers significantly lower bleeding rates (1.6% vs 5.4%) with non-inferior infection control over 5 years . Intracapsular techniques preserve the tonsillar capsule, potentially explaining reduced vascular injury.

For minimizing pain: Intracapsular coblation demonstrates significantly less late postoperative pain (SMD -0.78) , though early pain (≤48 hours) is not significantly different between techniques . This late pain reduction may result from prevention of the "postoperative dip" phenomenon occurring several days after surgery.

For optimizing operative efficiency: Laser and coblation techniques offer shorter operative times (10-15 minutes vs 20 minutes for cold dissection) and reduced blood loss.

For long-term infection control: Total tonsillectomy may have a small theoretical advantage (5.4% vs 8.1% recurrence at one year, though not significant) , but the 5-year

follow-up data showing no bacterial inflammation after partial tonsillectomy suggests clinical equivalence.

Context-Specific Recommendations

Based on the evidence synthesis, management recommendations can be stratified by clinical context:

Severely affected patients meeting Paradise criteria: Tonsillectomy is indicated and highly effective, with number needed to treat data suggesting significant reduction in infection burden . Prompt surgery (within 10 weeks) maximizes benefit .

Moderately affected patients: Either watchful waiting with medical management or surgery may be appropriate. Patients will experience substantial natural improvement with medical management, though surgery offers more rapid and complete resolution . Shared decision-making incorporating parent/patient preferences is essential, given demonstrated willingness to pay (£8,059 mean) for surgical intervention .

Patients with contraindications to surgery: Azithromycin prophylaxis (weekly dosing for 6 months) provides comparable outcomes to surgery over 5 years . Amoxicillin/clavulanate or clindamycin are preferred over penicillin for acute episodes requiring antibiotics .

Adolescent-specific considerations: Limited data specifically stratify adolescents from broader pediatric populations. Studies including adolescents (ages 12-15/16-18) within larger pediatric cohorts show consistent treatment effects without evident age-stratified differences. The study by Hong et al. in patients ≥16 years and Mahakit et al. in patients ≥12 years demonstrated similar patterns of antibiotic efficacy and surgical outcomes as pediatric studies.

Cost-Effectiveness Considerations

The incremental cost-effectiveness ratio for tonsillectomy was estimated at £261 per sore throat avoided (95% CI £161-£586) and £3,129-£6,904 per QALY gained . These values fall within typically accepted cost-effectiveness thresholds, supporting surgery as a reasonable option when clinically indicated. The as-treated analysis emphasizing prompt surgery suggests that delays in performing indicated surgery may diminish cost-effectiveness due to spontaneous improvement in the waiting period.

DISCUSSION

This comprehensive synthesis of 40 studies reveals a nuanced picture for managing recurrent tonsillitis in adolescents, where the optimal strategy is not monolithic but must be individualized based on disease severity, patient context, and valued outcomes. The discussion reconciles apparent contradictions in the literature, explores underlying mechanisms, and considers practical implications.

Reconciling Surgical and Medical Management Outcomes

A key finding is the demonstrable superiority of tonsillectomy in reducing sore throat frequency, particularly within the first two years post-intervention (Lock et al., 2010). The reported IRR of 0.54 in the second year signifies an almost halving of episodes relative to medical management. However, several studies report long-term equivalence between surgery and interventions like azithromycin prophylaxis (Diaa El Din El Hennawi & Ahmed, 2016). This apparent paradox can be explained by several critical factors:

1. **Timing of Intervention and Natural History:** The benefit of surgery is highly time-sensitive. The NESSTAC trial analysis shows that prompt surgery (within 10 weeks) prevents substantially more episodes than surgery delayed by 12 months (Paradise et al.,

1984). This is because the control (medical management/watchful waiting) group experiences significant spontaneous improvement over time. Studies with long wait times for surgery or extended follow-up durations may thus attenuate the measured surgical benefit, as the control group "catches up" via natural resolution (Hogg et al., 2022).

2. **Baseline Disease Severity:** Studies employing strict eligibility criteria, such as the Paradise criteria (≥7 episodes in 1 year, ≥5/year for 2 years, or ≥3/year for 3 years), consistently show strong surgical benefit (Paradise et al., 1984). In contrast, studies enrolling participants with milder or less rigorously defined recurrent tonsillitis show smaller effect sizes. For instance, the study demonstrating azithromycin equivalence to surgery enrolled children with only grade 1-2 tonsillar hypertrophy, potentially representing a less severely affected cohort (Diaa El Din El Hennawi & Ahmed, 2016).
3. **Outcome Measurement and Follow-up:** While short-term (<12 month) benefits of surgery are clear, differences may become statistically non-significant in the third year of follow-up in some trials, partly due to the natural decline in tonsillitis incidence with age and the aforementioned spontaneous improvement in control groups.

Mechanistic Basis for Antibiotic Efficacy

The clear superiority of clindamycin and amoxicillin/clavulanate over penicillin for recurrent GABHS tonsillitis is not serendipitous but has a firm microbiological basis. Studies indicate that beta-lactamase-producing aerobic and anaerobic bacteria are present in the tonsillar tissue of 85-96% of children with recurrent tonsillitis (Brook, 1989). These organisms inactivate penicillin, protecting co-existing GABHS. Clindamycin (which is not a beta-lactam) and amoxicillin/clavulanate (which contains a beta-lactamase inhibitor) remain effective in this environment, leading to significantly higher eradication rates (100% for amoxicillin/clavulanate vs. 70% for penicillin) and lower recurrence (Brook, 1989; Asensi et al., 1999). This underscores that the choice of antibiotic for acute treatment or prophylaxis must consider local microbiological resistance patterns. However, a systematic review cautions that the evidence for some antibiotic superiorities comes from studies with a high risk of bias, warranting moderate confidence in these conclusions (Munck et al., 2018).

Surgical Technique: A Trade-off Analysis

Modern otolaryngology offers multiple surgical techniques, each with a distinct outcome profile:

- **Minimizing Bleeding Risk:** Tonsillotomy is the standout choice, with a significantly lower postoperative haemorrhage rate (1.6%) compared to total tonsillectomy (5.4%) (Kisser et al., 2024). This is attributed to the preservation of the tonsillar capsule, which protects underlying major vessels.
- **Managing Postoperative Pain:** Intracapsular cobaltion techniques have been shown to result in significantly less late postoperative pain (standardized mean difference -0.78) compared to extracapsular methods, likely by reducing exposure and irritation of the pharyngeal muscles (Daskalakis et al., 2020). However, early pain (within 48 hours) may be comparable across techniques.
- **Operative Efficiency:** Cobaltion and laser techniques offer advantages in reduced operative time and decreased intraoperative blood loss compared to traditional cold steel dissection (Muthubabu et al., 2018; Elbadawey et al., 2015).
- **Long-term Efficacy:** Crucially, 5-year follow-up data confirm that the infection control offered by tonsillotomy is non-inferior to total tonsillectomy, with no evidence of bacterial inflammation in the residual tissue, affirming its viability as a long-term solution (Kisser et al., 2024).

Patient-Reported Outcomes and the Burden of Illness

The consistent improvement in QoL following successful intervention, whether surgical or medical, highlights that the impact of recurrent tonsillitis extends far beyond infection counts. Validated tools like the GBI show positive impacts on both physical and mental health domains post-tonsillectomy (Kisser et al., 2024). The high mean willingness-to-pay (£8,059) expressed by parents for a successful treatment underscores the profound perceived burden of this chronic condition on children and families (Zarod et al., 2011). Interestingly, studies of delayed surgery during the COVID-19 pandemic showed that even the waiting period, often involving intensified medical management, led to significant improvements in specific QoL domains measured by the T-14 score, such as eating habits and school absences (Hogg et al., 2022). This reinforces the value of active management, even if non-surgical.

Safety and Risk-Benefit Considerations

Surgical risks, though low, are non-negligible and central to decision-making. Post-tonsillectomy haemorrhage occurs in 2-7% of cases, with a small subset (1-2%) requiring re-operation (Morad et al., 2017). Mortality is exceedingly rare (1:16,000 to 1:35,000). Tonsillotomy's markedly lower bleeding rate is therefore a major safety advantage. Medical management with antibiotics is generally well-tolerated, with gastrointestinal side effects (mainly diarrhea) being the most common, occurring in 5.6-13.8% of patients on clindamycin or amoxicillin/clavulanate (Brook, 1989; Mahakit et al., 2006). Azithromycin is noted for its favourable tolerability profile with minimal side effects.

The Adolescent-Specific Evidence Vacuum

A critical limitation permeating this synthesis is the absence of studies that isolate and analyze adolescent outcomes. While studies like those by Mahakit et al. (2006) and Hong et al. (2013) included patients aged 12+, they did not provide age-stratified results. Adolescents differ from younger children in immune maturation, tonsil size, psychosocial factors affecting pain reporting and compliance, and the high value placed on social and academic participation. Therefore, while it is reasonable to assume that treatment effects are likely consistent, definitive conclusions about optimal timing, technique preferences, and PRO impacts specifically in adolescents cannot be drawn, representing a major priority for future research.

Synthesis for Clinical Practice

Informed by this evidence, a stratified approach is recommended:

1. **For severely affected adolescents** meeting stringent criteria (e.g., Paradise), **prompt tonsillectomy** (within 10 weeks) is strongly supported as the most effective intervention for rapidly reducing disease burden (Paradise et al., 1984). Tonsillotomy should be considered to minimize bleeding risk.
2. **For moderately affected adolescents**, a trial of **medical prophylaxis** (e.g., 6-month course of weekly azithromycin) or targeted use of **beta-lactamase-stable antibiotics** for acute episodes is a valid and effective alternative, especially if surgery is declined or contraindicated (Diaa El Din El Hennawi & Ahmed, 2016; Brook, 1989).
3. **Shared decision-making** is paramount. Discussions must incorporate: the certainty and timing of expected benefits, detailed risks of surgical complications, the commitment required for prolonged antibiotic prophylaxis, and the adolescent's own priorities regarding school, activities, and tolerance for pain or medication.

CONCLUSION AND RECOMMENDATIONS

Conclusion

This systematic evidence synthesis confirms that tonsillectomy is a highly effective intervention for significantly reducing the frequency and burden of recurrent tonsillitis, with benefits being greatest when surgery is performed promptly in severely affected individuals. Tonsillotomy emerges as a safer surgical alternative with non-inferior long-term efficacy and a significantly reduced risk of postoperative haemorrhage. Medical management, particularly employing antibiotic strategies that address beta-lactamase-mediated resistance (clindamycin, amoxicillin/clavulanate) or utilizing azithromycin for prophylaxis, provides a robust non-surgical pathway with comparable long-term outcomes for patients with moderate disease or surgical contraindications. Crucially, both surgical and effective medical interventions lead to meaningful improvements in patient-reported quality of life. However, the field is constrained by a significant lack of age-stratified data, preventing definitive, adolescent-specific recommendations and obscuring potential nuances in treatment response within this distinct developmental group.

Recommendations

For Clinical Practice:

1. Adopt an individualized, severity-based management algorithm. Use stringent criteria (e.g., Paradise) to identify candidates most likely to benefit definitively from surgery.
2. Offer tonsillotomy as a first-line surgical option when discussing tonsillectomy, clearly presenting its superior safety profile regarding bleeding risk.
3. For medical management, move beyond penicillin as first-line therapy for acute episodes in recurrent tonsillitis. Favor clindamycin or amoxicillin/clavulanate where local resistance patterns or clinical history suggest beta-lactamase involvement.
4. Engage adolescents and their families in detailed shared decision-making, transparently discussing the evidence on timing of benefit, risks, and the impact on quality of life.

For Future Research:

1. **Prioritize Age-Stratified Analysis:** Future RCTs and cohort studies on tonsillitis management must pre-plan and report outcomes specifically for adolescent subgroups (e.g., 10-14, 15-19 years) to build a dedicated evidence base.
2. **Conduct Direct Comparative Long-Term Trials:** There is a need for head-to-head, long-term (>5 years) RCTs comparing modern surgical techniques (tonsillotomy vs. intracapsular cobaltion) against long-term medical prophylaxis regimens in well-defined adolescent populations.
3. **Standardize Adolescent-Focused PROs:** Develop and consistently employ PRO measures that are validated and sensitive to the specific concerns of adolescents, such as social functioning, academic performance, and body image.
4. **Investigate Biomarkers and Patient Selection:** Research should explore clinical or microbiological biomarkers that can predict which adolescents will respond best to surgery versus medical management, enabling more personalized care.
5. **Economic Evaluations:** Conduct formal cost-effectiveness analyses from a societal perspective in adolescent populations, incorporating direct medical costs, indirect costs (parental work loss, school absences), and long-term QoL gains.

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