



Cost-benefit Analysis of Routine Histopathologic Examination of Tissue Post Adenotonsillectomy



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Background

Pediatric tonsillectomy and adenoidectomy (T&A) are among the most common surgical procedures performed in children under the age of 15 in the United States. Indications for surgery often include conditions such as obstructive sleep apnea and chronic tonsillitis [1]. It is currently routine for samples from T&A to be sent for histopathological analysis; however, the actual utility and cost-effectiveness of sending out these specimens have come into question.

Past research examining a large pool of pediatric patients who underwent routine tonsillectomies demonstrated that none of the tonsil specimens without any pre-surgery findings of tonsillar asymmetry, lymphadenopathy, patient history of prior malignancy, transplant, or family history of cancer were harboring any hematologic or lymphoid malignancy upon pathological analysis. Thus, it was concluded that pathologic analysis of these specimens without any other clinical suspicion was an inefficient use of resources as it did not improve care [2].

Research Objective

This study aims to analyze the cost of routine histopathological analysis of T&A specimens at a tertiary-care level hospital in upstate New York, investigate common indications for T&A, determine the incidence of unexpected histological findings, and consequently evaluate the overall cost-benefit of routine pathological examination of specimens.

Methods

2500 pathology reports and pre-operative forms of T&A performed in patients aged 0 -18 at Albany Medical Center from April of 2017-2022 were reviewed as a retrospective chart review. Patients' age at the surgery along with indication for surgery and pathology findings were documented and analyzed. Hospital fee for gross and microscopic examination of surgical pathology were obtained, along with the cost of special histological stains and diagnostic tools in order to calculate the overall cost of routine T&A tissue examination.

Cost Analysis

Service	Units	Cost
Level III, IV, V, VI Surgical pathology, gross and microscopic examination	3200	\$140,955
Immunocytochemistry	415	\$37,730
Flow Cytometry	65	\$20,815
Pathology Consultation During Surgery	100	\$15,480
In situ hybridization	55	\$6,810
Special Staining	65	\$3,345
		Total Cost: \$225,135

Figure 1. Cost breakdown of pathology services rendered for routine T&A over the course of 5 years.

Results

For 2,500 T&A cases there were 3,900 billing codes submitted. The outline of the charges for services rendered and the total cost for each is outlined in Figure 1. Pathology reports demonstrated that of the 2,500 samples there were only 3 with granulomatous inflammation (0.12%), 10 with actinomyces-related acute tonsillitis (0.4%), and 9 with crypt neutrophilic exudates (0.36%) as illustrated by figure 2. The rest of the cases (n=2478) were cleared as "mucosa-associated lymphoid tissue with follicular hyperplasia" (99.1 %). There were 0 malignant findings. The most common indication for surgery was tonsillar hypertrophy. Given that previous research has identified actinomyces and crypt neutrophilic exudates as a common cause of tonsillar hypertrophy [3,4], our study demonstrates that there were only 3 uncommon pathological findings for every \$225,135 spent.

Discussion

Approximately one million T&A specimens are sent to pathology labs annually and cost US health care system an estimated \$69,000,000 while the prevalence of malignancy is approximately 0.015% [5]. Past research demonstrates that malignancies and other abnormal cases in pediatric T&A specimens are sporadic and successfully identified by physicians ahead of time due to clinical indicators [6]. Our study discovered that even in patients who had multiple indications for T&A, the probability of the tissue sample containing malignancy or granulomatous inflammation were zero and 0.12% respectively, yet the cost of routine specimen examination amounted to \$225,135 in a 5-year period. This leads us to believe that eliminating routine T&A specimen analysis and only examining the suspected cases may be an effective way to cut excess healthcare costs.

References



Pathology Results

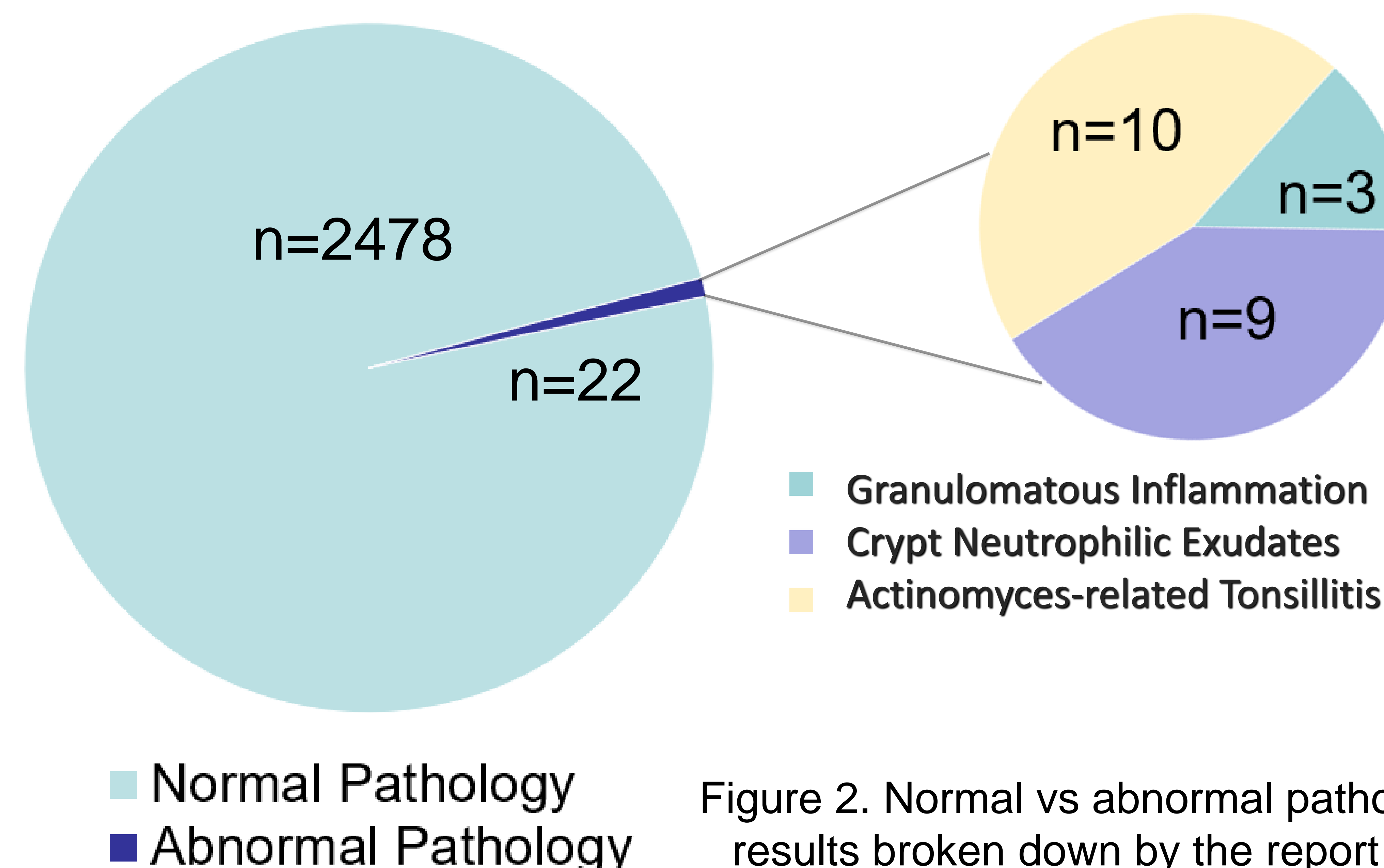


Figure 2. Normal vs abnormal pathology results broken down by the report findings.