Abstract

Objective: To evaluate the indications for observation versus surgery in the management of Q-tip induced tympanic membrane perforations (TMP).

Methods: Retrospective cohort study of 1540 patients with a diagnosis of TMP from 2001-2010. Patients with a Q-tip injury were subdivided into two groups: observation or surgery.

Results: Fifty-four of 1540 (3.5%) patients who presented with a TMP were secondary to Q-tip use. Three-fourths of the 54 patients (74%) underwent delayed surgical repair (5 days - 5 months) with 100% success. Preoperatively, one patient had facial nerve paralysis and two had vertigo, both had perilymphatic fistulae. Postoperatively, the facial nerve paralysis resolved and only one patient had persistent dizziness. Fifty of 54 patients opted not to undergo surgery with 35 patients who had follow-up. Thirty-four (97%) of the 35 patients who followed up had spontaneous healing. The average size of the perforation was 19% and average time to perforation closure was 1.75 months. Twelve of 35 patients had no ABG after healing. Two of 35 patients had dizziness immediately after injury with one having persistent dizziness.

Conclusion: Observation is an appropriate consideration for patients who have a TMP due to a Q-tip injury. Surgical intervention should be offered early when a perilymphatic fistula is suspected, if there are significant findings such as the presence of facial paralysis, severe vertigo, or profound sensorineural hearing loss. As otolaryngologists, we should be reluctant to offer surgical intervention of an acute injury without significant symptoms as most patients will heal spontaneously within 2 months.

Introduction

- Traumatic tympanic membrane perforations (TMP) are commonly caused by a slap injury to the ear, barotrauma, slap injury, or penetrating injury by objects such as cotton-tipped swabs (Q-tips)
- The association between TMP and Q-tip use was first reported by physicians in 1972.
- Immediate treatment for Q-tip injury includes observation or surgery (i.e. myringoplasty or tympanoplasty)
- Previous studies have suggested a watchful waiting period from 3-6 months for the management of traumatic TMP
- The purpose of this study is to evaluate the indications for observation versus surgery in the management of Q-tip induced TMP

Materials & Methods

- Retrospective case review approved by the Henry Ford Health System Institutional Review Board
- Charts of all patients diagnosed with TMP from 2001 to 2010 by the Department of Otolaryngology were reviewed
- Inclusion criteria were patients older than 18 years of age with a TMP secondary to Q tip use
- Data collected from qualifying subjects included: Size of initial TMP
- Clinical findings on initial and follow-up otologic exams
- Pre- and post-intervention otologic and vestibular symptoms
- Type of surgery (if performed) along with any post-operative complications
- Time to tympanic membrane closure
- Successful outcomes were defined as: Healed TMP
- Improved and/or corrected CHL
- Closure of the air bone gap (ABG)
- Resolution or improvement of vertigo, tinnitus, or facial nerve paralysis

Results

- 1540 patients presented with the diagnosis of TMP
- 54 (3.5%) patients suffered a TMP secondary to Q-tip use
- Surgical Intervention
  - 4 patients underwent surgery to repair the TMP (average size of the TMP was 37%)
  - Surgery was performed within 5 days - 5 months of injury
  - Two patients underwent a tympanoplasty and 1 had repair with a paper patch
  - 2 patients who underwent a tympanoplasty had severe vestibular symptoms with confirmed perilymphatic fistula
  - 1 subject had facial nerve paralysis
- 3 of 4 surgical patients had an initial average ABG of 43.3 dB, average SRT of 37, and average word recognition score of 75% (Figures 1-3)
- Postoperative audiometric testing revealed an average SRT of 25 and an average word recognition score of 92% (Figures 2-3)
- The vestibular symptoms and facial nerve paralysis resolved following surgical repair
- Medical Intervention
  - 50 subjects did not undergo surgery for their TMP (initial size of the TMP ranged from 5-60% with average of 19%)
  - Initial audiometric testing revealed an average ABG of 15, average SRT of 25.2, and an average word recognition score of 90.79% (Figures 1-3)
  - 35 patients had proper follow up with 34 subjects (97%) having spontaneous tympanic membrane closure
  - Average time for spontaneous TM closure was 1.75 months (ranging from 1 week - 7 months) and the average follow-up time was 2.5 months
  - Post-treatment audiometric testing revealed an ABG of 2.11, average SRT of 17.68, and an average word recognition score of 96.08% (Figures 1-3)

Discussion

- Over half of patients seen in otolaryngology clinics, regardless of their primary complaint, admit to cotton-swab usage to clean their ear canals
- It is evident from previous studies1,2,4,5,6 and this one that cotton-swab use can lead to ear canal laceration and potentially TMP. Thus, the old adage prevails, that Q-tips should never be placed in the ear.
- Initial evaluation of traumatic TMP should include otologic symptoms, evaluation of neurologic deficits, and audiometry
- The presence of neurologic deficits, such as facial nerve paralysis, suspected perilymphatic fistula, or ossicular chain discontinuity all require surgical intervention in repairing the TMP and associated defect
- Surgical intervention resulted in 100% success in this study, with only one patient suffering from mild, but improved vertigo
- If the TMP is not associated with severe symptoms (vertigo and sensorineural hearing loss) or other ear injury, observation is an appropriate strategy
- Amadasun et al found a closure rate of 72.7-86.7% of traumatic TMP which were observed and non-surgically treated4
- We observed a closure rate of 97% with an average time for closure of the tympanic membrane following traumatic TMP to be less than 2 months
- Proper follow-up with audiometry after TMP is healed is essential to ensure there is no persistent conductive hearing loss

Conclusion

- Despite appropriate warnings, people continue to use cotton-swabs to remove wax from their external auditory canal and are at risk of causing a TMP
- Otolaryngologists and primary care physicians need to increase our efforts to educate our patients on the risks of using cotton-tipped swabs
- Most traumatic TMP secondary to cotton-swab use can be observed, as most heal spontaneously within 2 months
- When severe vertigo, sensorineural hearing loss, or neural deficit is present, surgical exploration and repair is the preferred modality

References

2. Barton RT. Q-tip injuries. JAMA 1972;220:1019