

TREATMENT OF OTITIS MEDIA WITH EFFUSION: EARLY RESULTS

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SUMMARY

Artificial ventilation of an under-ventilated middle ear by means of a tympanostomy tube still is a subject to controversy. We present a series of 149 ears of which tympanostomy tubes were inserted, the audiometric gain and the complications we have observed. 88.3 % of the ears had air-bone gaps minimized at the postoperative first month. The overall rate of complications was found to be 10.7 %, with 4.2% as temporary complications. We believe that insertion of a ventilation tube still is the treatment of choice for otitis media with effusion, at least for selected cases.

Key words: Otitis media with effusion, treatment

INTRODUCTION

Since the re-introduction of the tympanostomy tubes into the field of continuous ventilation of the under-ventilated middle ear by Armstrong in 1954 (1), no other method has received so much acceptance. Various studies have shown that this procedure is continuing to rise in rate (2). Interestingly, the author who had re-introduced this method wrote another paper concerning the use, abuse and cost-benefit ratio of the tympanostomy tubes (3). A controversy still goes on; whether inserting a tube or not, yet is the main question. This paper is written in order to present our treatment policy for otitis media with effusion, the early results and complications we have observed.

MATERIALS AND METHODS

During one and half-a-year period, 149 tubes were inserted to the eardrums 40 girls, 42 boys with a mean age of 6.9 years (3-21 years) (Fig.1). This series composes those patients who either were unresponsive to the conservative management for 3 months, or those with additional problems, such as an air-bone gap of

more than 30 dB, or for lesser air-bone gaps of patients with medium-to-severe sensorineural hearing losses, and finally, those with eardrum changes morphologically potential of producing important sequelae.

In the postoperative period, audiometric examination together with otoscopy were performed for each patient. A total of 25 patients have completed their follow-up for one year; the remainder consists of those either who did not attend regularly for controls (5 patients), or those who are not within the first postoperative year (52 patients).

Re-insertion was performed in a total of 2 patients' 4 ears, who had re-accumulation of effusion, type B tympanogram, and a hearing loss, for at least the three months of observation period.

RESULTS

The air-bone gaps at the mid-frequencies (500+1000+2000) of the patients at the preoperative period together with the post-operative findings at the first and seventh postoperative months are given at Table I. Audiometric results of 133 ears were available at the preoperative period; most of these ears had hearing losses between 21 and 30 dB (39.1%), whereas there were ears with hearing losses up to 50 dB. At the postoperative first month, there still were 2 ears within the same range; however, these were the ears with their tubes occluded by crusts, etc... At the seventh month, there were ears with hearing losses up to 30 dB. In one of these ears it was thought that the persistent otorrhoe could be the cause of the hearing loss; however there was no apparent cause for the hearing loss of the second ear.

Thus, tubes were extracted from both of these ears.

The preoperative tympanometric findings of a total of 136 ears and the postoperative tympanograms of those ears which have extruded the tubes or the tubes have been extracted for various reasons are given at Table II.

Types of the tubes inserted are given at Table III. The preoperative findings of the patients have not been an indication as for the tube type; thus the figures concerning the results are all of a randomized basis.

A total of 76 adenoidectomies were performed in this series (92.7%). This figure represents another aspect of our treatment policy.

Spontaneous extrusion periods of various types of tubes are given at Table IV. The extrusion rate for Paparella type- I ventilation tube is quite high, up to 88.8% for the first year, whereas none of the Paparella type- II tubes were extruded. However, we have begun to utilize these tubes very recently; thus, no conclusive drawings are mentioned. The extrusion rates of T-tubes are very low.

At table V, the complications observed during this period are enlisted. The overall rate of complications were 10.7%; however 4.2% of these were temporary and controllable by conservative measures.

DISCUSSION

Ventilatory trials of an under-ventilated middle ear have been the top subject for many physicians after the recognition of eustachian tube obstruction as a cause of deafness in the 18th century (4). Aside from the procedures involving the nasopharynx and the eustachian tube, attempts to keep the opening in the tympanic membrane open following myringotomy have started a new era in the otologic field; that is the insertion of ventilation tubes. Paradise has estimated that 2 million tubes were inserted in 1977 (5). A great controversy among physicians still exists, however.

The high prevalence of otitis media with effusion and the complications and sequela in the untreated ears have led the ENT society to develop rules as for indications of treatment. However, just as a human being could not be assessed within strict standards, these attempts have failed to be accepted universally.

The patients in the present study are selected cases, i.e., unresponsive to conservative management or

those with additional problems, enlisted above. However, no criterion was followed while choosing the type of tube to be inserted. The high ratio of T-tubes in this series is the result of their availability. We have been inserting Paparella type- II tubes since the last six months; the late results to be published later.

Preoperative hearing levels and the postoperative gains are given at Table I. We have preferred to state the hearing levels as of air-bone gaps, in other words, the conductive type of hearing loss. 67.7% of our cases had hearing losses ranging from 11 to 30 dB. This finding is similar to the findings of McDermott et al. (1983); they found that the great proportion of the patients taken on surgery had air-bone gaps within 20 to 30 dB (6). Hinchcliffe (1985) stated that the mean hearing levels of patients with serious otitis media ranges from 23 to 29 dB (7).

The early results of treatment of otitis media with effusion with tympanostomy tubes are reported to be fairly good; the gain was 20 dB or less in 74% to 90% of the cases (8,9). Tavin and his colleagues studied different types of tympanostomy tubes and have reported an average improvement spectrum of 1.9 to 22.1 dB (10). We have used four different types of tympanostomy tubes, enlisted at Table III. The modified T-tubes were the most common type to be used; however this is a result of availability, instead of any medical indication.

Adenoidectomy alone or as an adjunction to the implantation of a transmyringal tube has been advocated by many authors (11). We have performed adenoidectomy in 76 out of 82 cases (92.7%).

Cases of aberrant jugular bulb, aberrant carotid arteries, and persistent stapedia arteries injured during middle ear surgery and similarly, unusual instances of incudostapedial joint disarticulation or sensori-neural impairment with tympanostomy tube insertion have been reported (5, 12). The most common early complications are otorrhoea, blockage, and development of granulation tissues. Otorrhoea may occur after tube insertion in between 5% to 68% of cases (12, 13, 14). We have observed otorrhoea in a total of 11 out of 149 cases (7.4%), of which six of them were temporary. This rate is quite low in respect to the accumulation of the prevalence rates reported in the literature.

Blockage or occlusion of the tubelumen with crusts is also another relatively frequent complication (15),

with figures reported up to 23% (16). Granulation tissue formation is reported in between 1.5% to 16% (10,14). We have not encountered any granuloma formation in the present series.

Spontaneous extrusion periods of various types of tympanostomy tubes of the present series are given in Table V. Extrusion rates of T-tubes are relatively low, whereas that of Paparella type-I tubes are much higher. The more recently utilized Paparella type-II tube seems to stay in place for a longer period; however data concerning this particular type of tube has not accumulated sufficiently yet and this short experience should not be accepted as a reliable parameter to state any conclusion.

Conclusively, otitis media with effusion, if let untreated, has a high potential to cause numerous complications and most importantly hearing loss. This common disease of childhood still is in need of further investigation. However, speaking for today, effusions persisting for more than 6 months unilaterally or more than 3 months bilaterally, or those associated with a medium- profound sensorineural hearing loss, or those that have caused a conductive type of hearing loss more than 30 dB, and finally, those which have the potential to produce important sequelae and/or complications represent the cases that require further care, possibly artificial ventilation. Adenoidectomy, although unproved, seems to be beneficial in these patients.

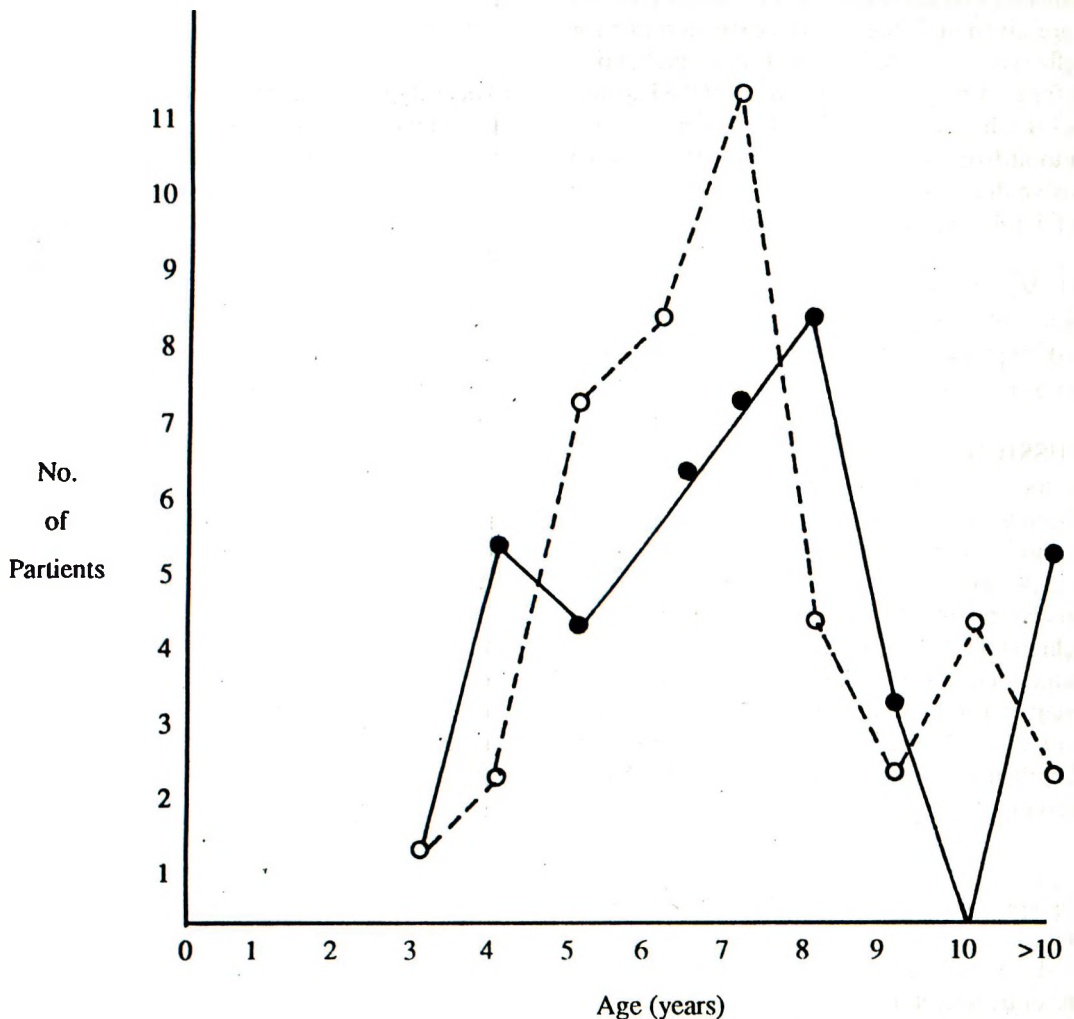


Fig. 1: Age and sex distribution of patients (Interrupted lines indicate girls).

Table I: Audiometric evaluations of ears preoperatively, postoperatively at the first month and at the seventh month. The air-bone gaps are the mean level of the values obtained at the mid-frequencies (500 + 1000 + 2000 Hz).

AIR-BONE GAP (dB)	<u>PREOPERATIVE EVALUATION</u>		<u>POSTOPERATIVE EVALUATION</u>			
	<u>No. of ears</u>	<u>%</u>	<u>1st month</u>		<u>7th month</u>	
			<u>No.</u>	<u>%</u>	<u>No.</u>	<u>%</u>
0-10	5	3.8	84	76.5	43	79.6
11-20	38	28.6	13	11.8	8	14.8
21-30	52	39.1	6	5.4	3	5.6
31-40	28	21.0	5	4.5	-	-
41-50	10	7.5	2	1.8	-	-
TOTAL	133	100.0	110	100.0	54	100.0

Table II: Tympanometric evaluations of ears preoperatively and the postoperative values of ears that have ejected the tubes and the perforations closed.

TYPE OF TYMPANOGRAM (<u>Jerger's classification</u>)	<u>PREOPERATIVE</u>		<u>POSTOPERATIVE</u>	
	<u>FINDINGS</u>		<u>FINDINGS</u>	
	<u>No.</u>	<u>%</u>	<u>No.</u>	<u>%</u>
A	1	0.8	5	100.0
B	112	82.3	-	-
C	23	16.9	-	-
TOTAL	136	100.0	5	100.0

Table III: Types of tubes inserted.

<u>TYPE OF TUBE</u>	<u>NO. OF EARS</u>
Paparella type I	18
Paparella type II	12
Modified T-tube	117
T-grommet	2
TOTAL	149

Table IV: Spontaneous extrusion (ejection) periods of the tubes

<u>PERIOD</u> <u>(IN MONTHS)</u>	<u>NUMBER OF TUBES EXTRUDED</u>		
	<u>Paparella-I</u>	<u>Paparella-2</u>	<u>T-tube</u>
0- 1	1	-	-
2- 4	7	-	4
5- 8	7	-	1
9- 12	1	-	-
TOTAL	16(18)*	-	5(117)*

* The numbers given in the parantheses represent the total number of that type of tube inserted.

Table V: Complications.

<u>TYPE OF COMPLICATION</u>	<u>NO. OF EARS</u>
Temporary otorrhoe	3
Persistent otorrhoe	5
Acute otitis media	3
Occlusion of the tubal lumen with crusts	5
TOTAL	16

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