

Rhinopharynx endoscopy in the diagnosis of chronic otitis media with effusion in infancy

La diagnosi endoscopica della ipertrofia adenoidea nelle otiti medie croniche essudative dell'infanzia

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Summary

Chronic otitis media with effusion is an inflammatory process of the mucosa of the middle ear persisting for more than 3 months, being most frequent in infancy, and is correlated with marked tube obstruction. In infancy, the most frequent cause of this obstruction is adenoid hypertrophy and diagnosis, clinical or radiological, is often not confirmed by rhinopharynx fiberoendoscopy. Since, in these cases, treatment is often surgical, it is possible that small patients may be submitted, unnecessarily, to adenoidectomy. In collaboration with the Paediatric Clinic, the present study on an infant outpatient population with nasal respiratory difficulty, associated with chronic otitis media with effusion, was, therefore, aimed at standardizing the endoscopic diagnosis of patients with suspected adenoid hypertrophy. Between October and December 2002, 32 consecutive patients, aged between 4 and 11 years, all oral breathers with OME, were sent to our attention from the Paediatric Clinic. All those patients, with indication for adenoidectomy, have been enrolled in the study and submitted to fiberoendoscopic examination of the external ear and nose. Nasal respiration was confirmed with active anterior rhinomanometry. Endoscopic evaluation of the rhinopharynx, aimed at assessing adenoid dimensions and their relationship with the auditory tube, has been expressed in four degrees of increasing severity and adenoidectomy was indicated in those cases, classified, by us, as third and fourth degree. In our experience, endoscopic examination of the rhinopharynx has, however, shown that only 9 children (28.2%) presented an absolute need to undergo adenoidectomy since they were carriers of massive adenoid hypertrophy with tubal obstruction and consequent bilateral glue ear (3rd and 4th degree) while, in all other cases (71.8%), the clinical and radiological findings did not correspond to endoscopic data. Diagnostic accuracy that characterizes rhinopharyngeal fiberoendoscopy is, therefore, in our opinion, of fundamental importance to avoid these errors, as far as possible, and in establishing an appropriate therapeutic programme.

Riassunto

L'otite media cronica essudativa (OME) è un processo flogistico della mucosa dell'orecchio medio che persiste per oltre tre mesi, frequentissimo nell'infanzia e, di solito, strettamente correlato all'ostruzione tubarica di grado marcato. Nei bambini, la causa più frequente di questa ostruzione è certamente l'ipertrofia adenoidea la cui diagnosi, su base clinica o radiologica, non trova spesso conferma con la fibroendoscopia delle fosse nasali. Pertanto è possibile che i piccoli pazienti vengano sottoposti inutilmente alla adenoidectomia. In collaborazione con la Clinica Pediatrica della nostra Università, abbiamo effettuato questo studio sulla popolazione infantile ambulatoriale affetta da disturbi respiratori associati a OME con la finalità di standardizzare la diagnosi endoscopica dei pazienti con sospetta ipertrofia adenoidea. Sono stati valutati, tra ottobre e dicembre 2002, 32 pazienti consecutivi, di età compresa tra i 4 e 11 anni, tutti respiratori orali e con OME. Tutti i pazienti sono stati sottoposti ad esame endoscopico dell'orecchio esterno e delle fosse nasali e la difficoltà respiratoria nasale è stata obiettivamente valutata mediante rino-manometria anteriore attiva. La valutazione endoscopica del rinofaringe, mirata alla osservazione delle dimensioni delle adenoidi ed al loro rapporto con la tuba uditiva, è stata espressa in quattro gradi di gravità crescente e l'intervento di adenoidectomia è stato indicato nei casi relativi al 3° e 4° grado della classificazione da noi proposta. Nella nostra esperienza l'esame endoscopico del rinofaringe ha potuto evidenziare che solo il 28,2% dei bambini aveva necessità assoluta di essere sottoposto all'intervento chirurgico. In tutti gli altri casi (71,8%), il quadro clinico e radiologico non era affatto corrispondente alla visione endoscopica. L'accuratezza diagnostica che caratterizza la fibroendoscopia rinofaringea, a nostro giudizio, è pertanto di fondamentale importanza nell'evitare gli errori diagnostici e nell'impostare un programma terapeutico adeguato.

Introduction

Chronic otitis media (COM) is defined as inflammation of the mucosa of the middle ear and the adjacent

cavities, that persists >3 months and is accompanied by hydrotis behind the intact tympanic membrane but in the absence of acute symptomatology, or due to otorrhea that results from tympanic perforation¹⁻⁶.

Of the various types of chronic otitis media, the effusive form (COME), also called secretory otitis media and glue ear in infancy, represents a physiopathologic entity of great importance due to the frequency with which it manifests (the prevalence being 12% before 3 years of age, 4-18% at 4-5 years and 3-9% at 6-9 years)¹ since the ensuing hypoacusia markedly influences, both language learning and the psychological development of the child⁷⁻¹⁰.

From an aetiopathologic point of view, in childhood and especially during or after inflammatory-obstructive disease of the rhinopharynx^{4,5,11}, the middle ear may present a disease characterized by the presence of seromucous effusion, defined as "glue ear"^{3,4}, the evolution of which, observed with, more or less frequent, repeated acute episodes can determine, if not treated, or not appropriately treated, worsening of the condition. The possibility of becoming chronic and the frequency with which COME patients seek medical attention indicates the need for an aetiopathological diagnosis of certainty which is frequently correlated with the impediment of auditory tube opening into the pharynx.

Tubal block can be of variable origin:

- 1) functional, on account of persistent collapsing of the tubal wall;
- 2) mechanical, secondary to adenoid hypertrophy or allergic and/or infective oedema of the tubal mucosa^{4,5}.

In paediatric age, adenotonsillar hypertrophy is the obstructive cause most frequently diagnosed with a simple clinical and radiological approach^{6,10,12}; albeit quite often the degree of advanced hypertrophy is not confirmed by fiberendoscopy of the nasal fossae.

In collaboration with the Paediatric Clinic of our Hospital, we have carried out a study on an infant outpatient population presenting nasal respiratory difficulty associated with COME.

Aim of the study was to evaluate, by means of endoscopy, patients requiring adenoidectomy.

Patients and methods

The study population comprised 32 consecutive patients (19 male, 13 female), aged between 4 and 11 years (mean 7.6), that have been sent to our attention from the Paediatric Clinic.

They all presented pronounced nasal respiratory obstruction ("oral breathers"), chronic otitis with B-type tympanogram and absence of stapedial reflex of at least 3 months' duration. In all these cases, X-ray, in the lateral projection of the epipharynx, demonstrated adenoid hyperplasia causing sub-obstruction of the airway. There was a strong indication for adenoidectomy, in all these patients.

All underwent endoscopic examination of the exter-

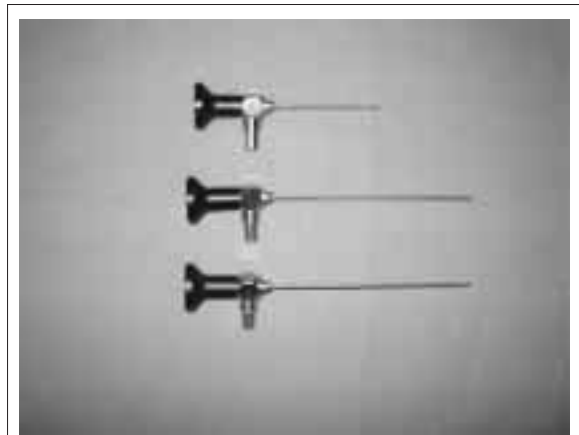


Fig. 1. Instruments for paediatric fiberendoscopy.

nal ear with rigid 4 mm Storz fiberendoscope, and of the nasal fossae and rhinopharynx with a rigid 2.7 mm Storz paediatric fiberendoscope (Fig. 1).

In all cases, nasal respiration was confirmed with active anterior rhinomanometry. The instrument used was the ATMOS Rhinomanometer 300 N. Endoscopic evaluation of the rhinopharynx, aimed at observation of the adenoid dimensions and their relationship with the auditory tube, has been expressed in four degrees of increasing severity (Fig. 2):

- 1st degree (25% of choanal obstruction): simple hyperplasia with pervious tube;
- 2nd degree (50% of choanal obstruction): reduc-

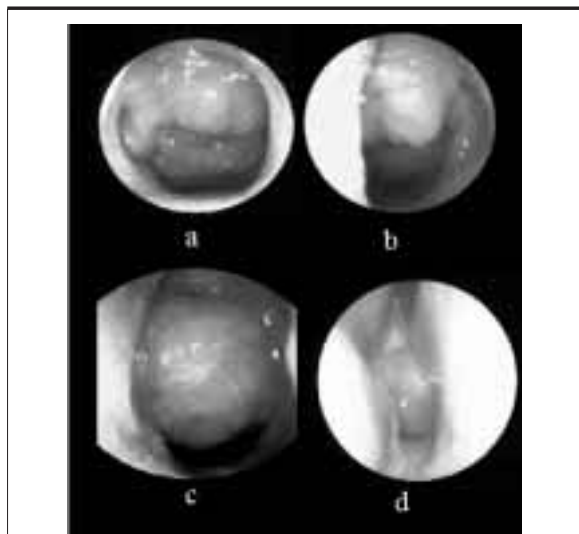


Fig. 2. Classification of rhinopharyngeal obstruction due to adenoid hypertrophy: a) 1st stage; b) 2nd stage; c) 3rd stage; d) 4th stage.

tion of the opening of the choana with pervious tube;

- 3rd degree: subtotal (75%) choanal obstruction with complete tubal obstruction;
- 4th degree: complete choanal obstruction (100%).

Adenoidectomy is indicated in those cases belonging to the third and fourth degree classification, proposed by us.

In the few cases in which fiberoendoscopy was not tolerated by the patient, we used a local anesthetic (Xylocaine 5%), in contact with the nasal mucosa, associated with a non-adrenergic vasoconstrictor (naphazoline) to avoid exposing the patient to variations in cardiac rhythm.

Results

Using rhinomanometry, all 32 children presented objective nasal respiratory difficulty and otoscopy documenting, in 9 cases (28.2%), bilateral glue ear while in 23 cases (71.3%) tympanic retraction was present with air-fluid levels. The endoscopic examination of the nasal fossae documented, in 17 patients (53.12%), significant hypertrophy of the turbinates, associated with deviation of the septum in 6 patients (35.29%) and adenoid hyperplasia in 8, (47.05%); rhinosinus problems in the active phase were, on the other hand, present in 7 cases (21.87%). There was no significant presence of rhinosinus pathology, in the active phase, in 8 of the subjects (25%).

Rhinoscopy enabled us to evaluate the entity of the pharynx and the auditory tube opening obstruction due to adenoid hyperplasia, documenting 3 cases (9.37%) of 4th degree hyperplasia; 6 cases (18.75%) of 3rd degree hyperplasia; 11 cases (34.37%) of 2nd degree hyperplasia while in 9 children (28.12%) a situation of 1st degree was verified. Three patients (9%) did not present adenoid hyperplasia.

In 3 cases, local anaesthetic was necessary to carry out endoscopy.

Discussion and conclusions

The intimate relationship between the opening of the nasal fossae and chronic dysfunctions of the middle ear are now well known and have been extensively described in the international literature^{4 11-16}.

Nevertheless, at present, especially in the paediatric environment, nasal respiratory difficulty and COME, associated or not, appear to be considered synonymous with adenoid hypertrophy. Frequently, we observe, in the ENT Outpatient Unit, young oral breathers presenting with an X-ray of the epipharynx. In the majority of these cases, the X-rays demon-

strate a marked obstruction, on the basis of which the paediatrician suggests the need for adenoidectomy. From the literature, a correlation exists between X-ray evidence of respiratory obstruction and effective adenoid hyperplasia^{10 12 17 18}. Nevertheless, lateral soft tissue neck X-ray (LSTN) is a static study of rhinopharynx which modifies its volume in relation to its content and to movements of the soft palate. This, moving upwards while swallowing or during phonation, reduces its volume. Direct observation of the rhinopharynx cavity and of its content allows, instead, dynamic evaluation of nasal perviety. For this reason, in our patients, surgical indication must be based and confirmed by endoscopic evaluation of the nasal cavities and of the rhinopharynx. Rhinofiberscopy, and the use of endoscopy, in general, are the most important advancements achieved, in the last decade, in the ENT field, both in terms of diagnostic workup and surgical outpatient treatment. Rhinopharynx endoscopy is easy to perform, risk-free, well tolerated even by small patients, a low cost exam, that allows complete examination of the nasal cavities, the rhinopharynx region, the condition of the tubal ostium, the entity of adenotonsillar hypertrophy, the situation at the base of the tongue, of the epiglottis, the glottal region, etc.^{2 19-24}.

A study performed by Wang et al.^{10 12} has proposed the classification and differentiation, on the basis of endoscopic results, of three types of tubal obstruction, considering the variable distance of adenoid tissue from the vomer, on the basis of radiologic evidence, tympanogram results and clinical condition. This study focused on the correlation between nasal obstruction and tubal obstruction with the type of tympanogram recorded, revealing, moreover, the major diagnostic efficiency of rhinopharynx fiberoendoscopy in comparison to standard radiological results. We, however, consider it more worthwhile to distinguish four degrees of adenoid hyperplasia directly obstructing the tubal ostium or through peritubal lymphatic stasis. These 32 young oral breathers with otological problems were studied in order to establish which clinical and radiological diagnosis of adenoid hypertrophy indicated them as candidates for the operation. In these young patients, the endoscopic examination of the rhinopharynx had, however, revealed that only 9 children (28.2%) had absolute need to undergo adenoidectomy since they were carriers of massive adenoid hypertrophy with tubal obstruction and consequent bilateral glue ear (3rd and 4th degree). In all the other cases (71.8%), the X-ray results did not correspond to endoscopic findings and transudative otitis was a consequence of other disorders of nasal respiration, such as turbinate hypertrophy (53.12%), associated or not with deviation of the nasal septum or rhinosinusitis (21.87%). In these

patients, therefore, adenoidectomy was not indicated. Instead, it would have exposed them to all the risks related to the operation without having contributed to a concrete advantage in terms of treatment of otitis and/or nasal obstruction.

The excellent compliance of the paediatric patient, with regard to this method, is shown by the low percentage that required local anaesthesia (9.4%).

Our experience, therefore, demonstrates that in children with COME, fiberoptic endoscopy of the rhinopharynx must be considered a first choice method in the diagnostic workup of adenoid hypertrophy and the consequent auditory tube involvement. It eliminates false positives observed with conventional X-ray examinations and allows precise evaluation of the obstruction of the adenoid masses. It also offers a more precise differential diagnosis between lymphatic hyperplasia and other types of nasal respiration disorders. In the international literature, of the methods of quantitative evaluation of adenoid hyperplasia, the most acknowledged is that of Wang^{10,12}, that, as already mentioned, outlines three classes, on the basis of complex anatomic and functional

data, not directly correlated to the auditory tube, the involvement of which is considered separately.

Our proposal to subdivide adenoid hypertrophy into four endoscopic classes better expresses the wide variety of endoscopic results and allows more precise judgement of nasal respiratory capacity, referring to the degree of choanal obstruction, and the involvement of the auditory tube in the hyperplastic process (Fig. 2).

In conclusion, the disorders that produce a tubal obstruction can manifest, at clinical observation, as chronic inflammatory processes, with little difference being detected between them. This contributes to the possibility of a diagnostic error that can lead to undertaking treatment which is not only unsuitable, but may even be excessive (overtreatment). At times, this can lead to worsening of the otological condition and negative repercussions on the auditory function as well as on the child's psychological development⁷⁻¹⁰. The diagnostic accuracy that characterizes rhinopharyngeal fiberendoscopy is, therefore, of fundamental importance, in our opinion, in avoiding, as far as possible, these errors and in establishing a suitable therapeutic programme.

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