

# Endonasal flexible fiberoptic endoscopy

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## SUMMARY

*By the introduction of the flexible fiberscope in the field of endonasal diagnostics and treatment, the following reasonable usefulness was obtained, and the results ascertained the great clinical value this method possesses.*

- 1. Easier approach to the ostia of all paranasal sinuses.*
- 2. Observation of the inside of all paranasal sinuses by the use of minor endonasal surgical procedures.*
- 3. Detailed examination of the nasopharyngeal structures by the pernasal approach.*
- 4. Observation of the orifice and the internal portion of the Eustachian tube.*
- 5. Detailed evaluation of velopharyngeal closure mechanism in cleft palate cases.*
- 6. All of these can be performed on an outpatient basis.*

## INTRODUCTION

With the aid of the rigid telescope, pioneering work in intranasal endoscopy has been successively done by a number of otolaryngologists during the 1970s (Buiter, 1976; Messerklinger, 1978; Draf, 1978; Terrier, 1978). On the other hand, during the past few years flexible fiberoptic endoscopes have increasingly been employed in the ENT field. The author discusses the possibility of broadening the range of visual examination and diagnostic procedures in the intranasal region by the introduction of flexible fiberoptic endoscopes.

## INSTRUMENTATION

The Olympus ENF-L, ENF-P, ENF-LB, NPF-S4 and a thin prototype scope were employed in this study. The outer diameter of each scope is 4.5, 3.7, 4.8, 3.5 and 2.7 mm respectively, and only the ENF-LB has an instrumentation channel of 2.0 mm in diameter. The specifications of the scopes are shown in Table 1.

## RESULTS

The main fields in which the author anticipated and obtained reasonable usefulness as a result of the introduction of the flexible fiberoptic endoscope are as follows:

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Table 1. Specifications of flexible ENT scopes applied in this study.

	ENF-L	ENF-P	prototype	ENF-LB	NPF-S4
angle of visual field	75°	75°	75°	70°	51°
direction of observation	forward	forward	forward	forward	lateral (90°)
outer diameter (tip)	4.4 mm	3.4 mm	2.7 mm	4.8 mm	3.6 mm
tip bending range up	130°	130°	160°	160°	90°
down	90°	90°	90°	90°	90°
diameter of channel	-	-	-	2.0 mm	-

### 1. Observation of the nasal cavity:

The most important sites of observation in the nasal cavity are the ostia of the paranasal sinuses. The findings of the ostia of the anterior-group sinuses, i.e. the maxillary sinus, anterior ethmoid cells, and the frontal sinus, which is opened in

Figure 1.  
Schematic drawing of intra-nasal view using the flexible fiberscope.

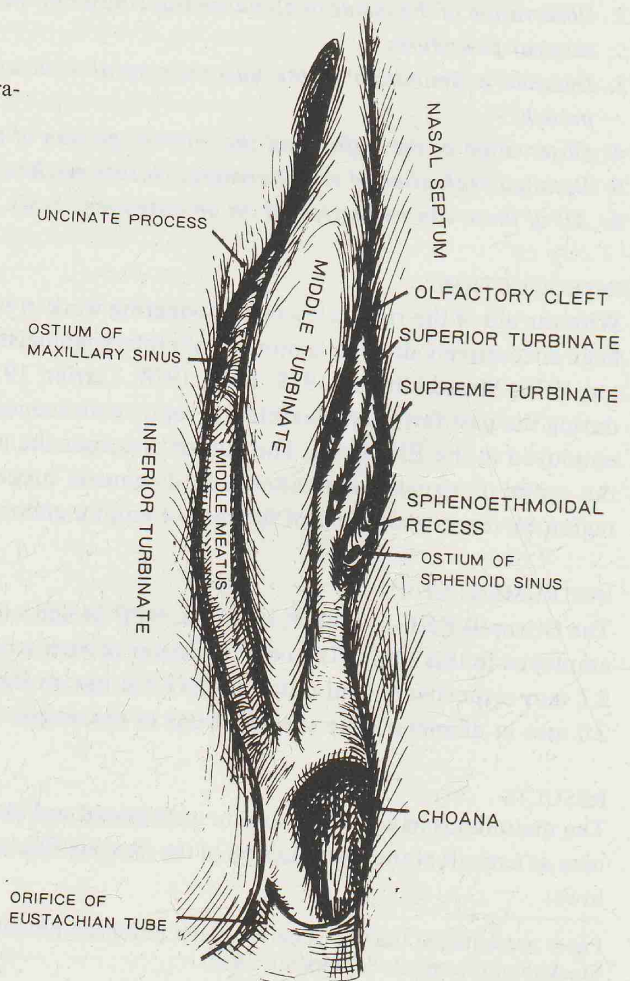
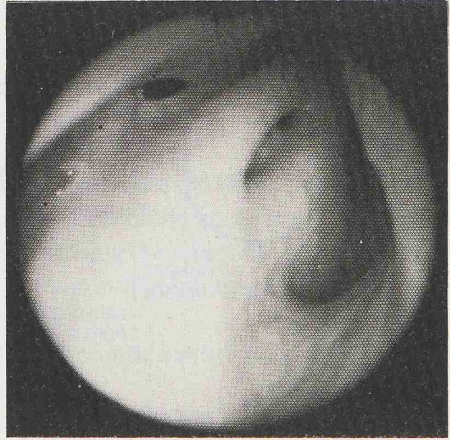


Figure 2. Showing mucopurulent discharge from the ostium of the posterior ethmoid cell in the superior meatus. From the left, the superior meatus, supreme meatus, and the sphenoidal recess.



the middle meatus, and of the posterior-group sinuses, i.e. the posterior ethmoid cells and sphenoid sinus, opened in the tegmental region of the posterior nasal cavity, and also the olfactory cleft can be grasped with less difficulty (Figures 1 and 2), even though direct inspection of the ostia is not always possible. These observation can be significant in the cases with sinusitis, malignancy and anosmia.

#### 2. Observation of the inside of the paranasal sinus:

Although a slim scope often permits insertion into the paranasal sinus through its ostium, the inside of all paranasal sinuses may be observed using minor endonasal surgical procedures. These observation procedures are also effective during endonasal surgery.

#### 3. Observation of the nasopharynx:

Detailed examination of the nasopharyngeal structures, i.e. the tubal torus and orifice, Rosenmüller fossa, and the nasopharyngeal tegmen and posterior wall is performed easily and precisely by the pernasal introduction of the flexible fiberoptic.

#### 4. Pneumatic endoscopy of the Eustachian tube:

Observation of the internal portion of the Eustachian tube cannot be performed using conventional rigid endoscopy. In this procedure the tubal lumen is expanded by insufflation air pressure to permit observation. It is necessary to use a flexible fiberoptic with a channel to permit passage of air. This method enables observation of the inside of the entire cartilaginous portion as far as the isthmus, and may be a significant measure in evaluating the pathological condition of tubal dysfunction in such cases as secretory otitis media, chronic otitis media with or without cholesteatoma, and pre- and postoperative condition of tympanoplasty (Figures 3 and 4).

#### 5. Observation and evaluation of the velopharyngeal closure:

This permits pre- and postoperative examination and evaluation of the natural

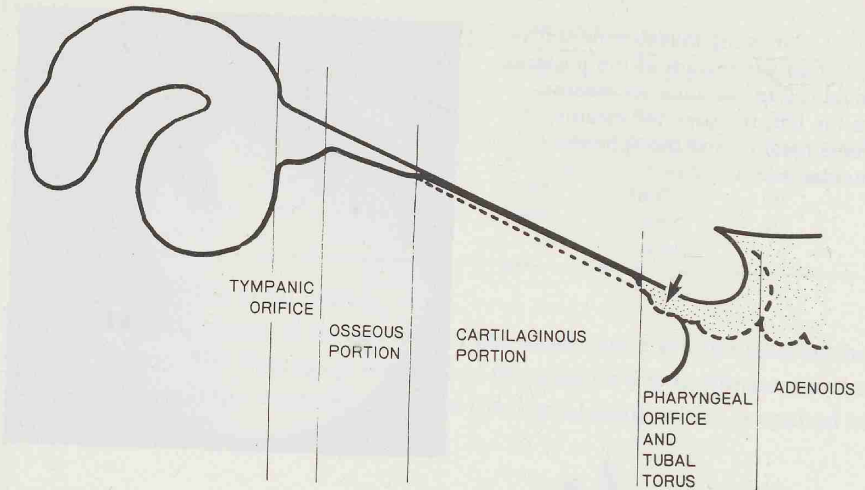


Figure 3. Schematic drawing of the anatomy of the Eustachian tube. The arrow indicates the intraluminal hypertrophy of the tubal tonsil.

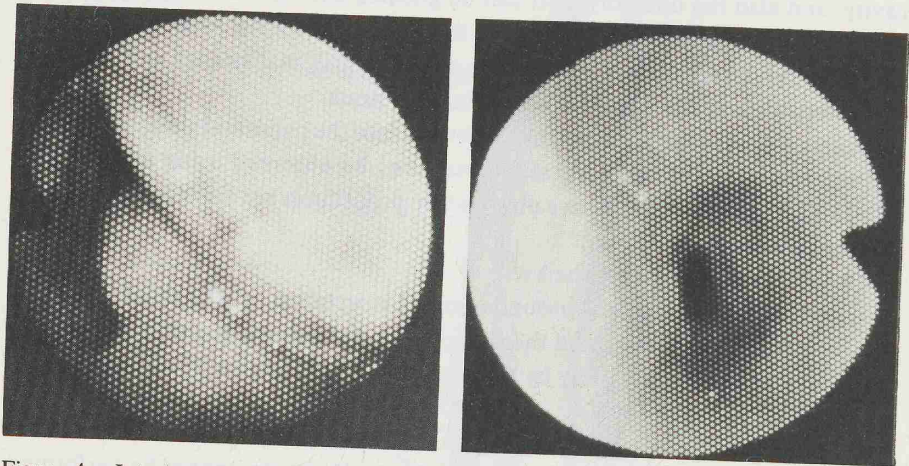


Figure 4. Intraluminal hypertrophy of the tubal tonsil in the case of secretory otitis media of a 9 year old boy (left) and edematous swelling of the mucosa of the cartilaginous portion of secretory otitis media of a 10 year old boy (right).

movement of velopharyngeal dysfunction in cleft palate cases and is effective in selecting the therapeutic approach and evaluating results. The VTR endoscopic procedure is a most effective method in analysing velopharyngeal movement.

#### DISCUSSION AND CONCLUSION

Flexible fiberoptic endoscopy in the intranasal region can be performed on a routine and outpatient basis. The accompanying range of visual examination and

therapeutic procedures in this field will expand with the following advantageous features:

1. Increased accessibility. 2. Less patient discomfort. 3. Easier insertion technique. 4. Low incidence of accidental injuries. 5. Simplified documentation by photography.

In addition to the above, flexible fiberscopes can be used for all areas in which rigid telescopes can be used. Of course, the quality of the image is slightly poorer than that of the rigid telescope, but by approaching the target site more closely, it is possible to increase the resolution and obtain sufficient image for diagnosis so that in practical use there is little difference.

The above outline of the endonasal flexible fiberoptic endoscopy shows the great clinical value this method possesses.

#### RÉSUMÉ

Depuis l'introduction du fibroscope flexible dans le domaine des diagnostics et traitement endonasaux il a prouvé son utilité pratique et les résultats obtenus ont établi la grande valeur clinique que possède cette méthode.

1. Abord plus facile des ostia de tous les sinus paranasaux.
2. Observation de l'intérieur de tous les sinus paranasaux par l'emploi de procédures chirurgicales endonasales simples.
3. Examen détaillé des structures nasopharyngiennes par l'abord pernasal.
4. Observation de l'orifice et de la partie interne de la trompe d'Eustache.
5. Evaluation détaillée du mécanisme de clôture vélopharyngienne dans les cas de palais fendus.
6. Tout cela peut être réalisé sur la base de consultation externe.

#### REFERENCES

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