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ORIGINAL ARTICLE

En-Bloc Uncinate Process Removal in Endoscopic Sinus Surgery Using Dr. Ahila's Uncinate Dissector: How I Do It.

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Abstract
Uncinectomy is a key and first step in functional endoscopic sinus surgery, as it allows access to the maxillary ostium and ethmoid infundibulum. Incomplete or piecemeal removal of the uncinate process can lead to poor exposure and difficulty in identifying the natural ostium. To describe our technique for complete removal of the uncinate process using Dr. Ahila's uncinate dissector. We outline a stepwise surgical technique based on our experience in approximately 180 patients with chronic rhinosinusitis, with or without nasal polyposis, treated over a three-year period at a tertiary care centre. The procedure involves controlled dissection of the uncinate process along its attachment to the lateral nasal wall under endoscopic guidance, followed by en-bloc removal using Blakesley forceps after resecting superior and inferior attachments with scissors. In most cases, the uncinate process was removed in a single piece, with consistent early identification of the natural maxillary ostium. The technique required minimal instrumentation and was not associated with major complications such as orbital or nasolacrimal duct injury. This "How I Do It" technique provides a simple and controlled method for uncinectomy. It facilitates en-bloc removal and reliable identification of the maxillary ostium and can be readily adopted in routine endoscopic sinus surgery.

Keywords Uncinectomy · FESS · Uncinate process · En-bloc dissection · Maxillary ostium

Introduction

Rhinosinusitis is a common disorder of the nose and paranasal sinuses, for which functional endoscopic sinus surgery (FESS) remains an established surgical treatment [1, 2]. Removal of the uncinate process is a key step in this procedure, as it provides access to the ethmoid infundibulum and facilitates identification of the natural maxillary ostium.

Several uncinectomy techniques have been described, including the classical approach using sickle knife, the Stammberger technique, the swing-door technique described by Wormald, and the D. S. Sethi technique, all of which are widely practiced [3]. Despite this, challenges such as incomplete removal, mucosal trauma, Bulla and orbital injury and difficulty in consistently identifying the natural ostium may still be encountered in routine practice.

In this article, we describe our technique of en-bloc uncinate process removal using our uncinate dissector. The method involves controlled dissection along the natural attachment of the uncinate process under direct endoscopic visualization, allowing it to be mobilised and removed

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en-bloc. This approach may reduce repeated instrumentation and facilitate early identification of the maxillary ostium while preserving surrounding structures [3, 4].

The instrument used in this technique has a blunt dissecting tip that enables dissection in the correct anatomical plane rather than cutting through the uncinate. In our experience, this allows better control and may reduce the risk of inadvertent injury to adjacent structures such as the lamina papyracea [3, 4].

This technique has evolved from routine our surgical practice with the aim of simplifying uncinectomy and improving consistency in surgical outcomes.

Materials and Methods

Successful uncinectomy depends on accurate identification of key anatomical landmarks [5, 6]. Preoperative evaluation with computed tomography (CT) is essential, as the attachment and configuration of the uncinate process vary between individuals and influence the surgical approach.

Key Anatomical Landmarks (Table 1)

Surgical Technique

Preparation and Exposure

Following standard preparation, the nasal cavity is decongested using adrenaline with 4% lignocaine. A 0-degree endoscope is used to visualise the middle meatus. Where access is limited, the middle turbinate is gently medialised to improve exposure of the uncinate process3.

Dissection and Mobilisation

The uncinate process is first palpated, and its line of attachment to the lateral nasal wall is identified. Using our uncinate dissector, an incision is made along this attachment. The instrument is then used to perform controlled medial dissection under direct endoscopic visualisation, staying close to the bone to maintain the correct plane.

Identification of Maxillary Ostium

As dissection progresses, the natural maxillary ostium is identified. This step serves as an important indicator of adequate mobilisation of the uncinate process while preserving its superior and posterior attachments.

En-Bloc Removal

The superior and horizontal components are divided using scissors to avoid shearing of adjacent mucosa. The uncinate process is then removed in one piece using straight Blakesley forceps [3]. Partial uncinectomy is not performed with this technique.

Precautions

Care is taken during dissection near the lamina papyracea to avoid orbital injury. Gentle handling and maintenance of the correct dissection plane are essential. Complete and controlled removal may help reduce postoperative synechiae between the lateral nasal wall and middle turbinate [6, 7].

Anatomical Variations

Certain variations of the uncinate process should be recognised preoperatively:

1. Uncinate bulla—pneumatization within the uncinate, which may alter surgical orientation [6]
2. Concave uncinate process—medially curved configuration associated with an increased risk of orbital injury during dissection [7, 8].

Several established techniques exist for uncinate process dissection:

1. Back-to-front approach: This method is particularly advantageous for less experienced surgeons, providing a more controlled dissection pathway [3].
2. Swing-door technique: The inferior free margin is transected first, followed by incision of the superior

Table 1 Key anatomical landmarks in uncinate process dissection

Structure	Location	Clinical significance
Uncinate process	Lateral nasal wall	Variable superior attachment (lamina papyracea, skull base, or middle turbinate) influences frontal sinus drainage pathway and determines the surgical approach
Ethmoidal bulla	Posterior to the uncinate process	Defines the posterior boundary of the ethmoid infundibulum and limits the extent of uncinate dissection
Natural maxillary ostium	Inferomedial to the uncinate process	Primary landmark for visualization; confirms adequate uncinate resection and serves as the entry point for maxillary sinus procedures
Nasolacrimal duct	Anteroinferior to the uncinate process	Structure at risk during anterior dissection; injury may result in epiphora and therefore requires careful preservation

attachment. The uncinate is then removed en-bloc using backbiting or angled forceps [9, 10].

Conventional uncinate process removal employs the following instruments [3, 4]:

- Ball-tip seeker or Lusk probe.
- Sickle knife or Freer elevator.
- Backbiting or straight Blakesley forceps.
- Powered microdebrider.

Key surgical objectives include [11–13]:

- Identification of the natural maxillary ostium.
- Posterior widening of the antrostomy.
- Vigilance for potential complications throughout the procedure.

Instrument Description and Clinical Application

Dr. Ahila's uncinate dissector is a purpose-designed instrument with a blunt dissecting tip at one end and an ergonomically shaped handle at the other (Fig. 1). The tip allows controlled engagement of the uncinate process and facilitates dissection along its natural attachment, addressing both the vertical and horizontal components. This enables mobilisation of the uncinate prior to removal, allowing it to be excised en-bloc under direct endoscopic visualisation (Fig. 2).

Fig. 1 Dr Ahila's uncinate dissector

This technique was employed at Prashanth Super Speciality Hospital, Velachery, following approval from the Institutional Ethics Committee. It was used in approximately 180 patients over a three-year period who underwent surgery for chronic rhinosinusitis, with or without nasal polyposis. Most procedures were performed under local anaesthesia with intravenous sedation, while a smaller number were carried out under general anaesthesia.

In our experience, the dissector provided good control during dissection and consistent exposure of the surgical field. Handling of the instrument was straightforward, and the need for additional instruments was minimal. A formal comparative analysis with conventional uncinectomy techniques was not undertaken.

Observed Outcomes (Table 2)

Sterilisation

The instrument is initially cleaned using an enzymatic solution with a contact time of 10–15 min. Soft brushes may be used to remove debris from surfaces and crevices. It is then rinsed with reverse osmosis or clean tap water, dried thoroughly, and sterilised using either autoclaving or ethylene oxide (ETO) gas.

Advantages

In our experience, our uncinate dissector allows controlled dissection along the natural attachment of the uncinate process, facilitating its removal as a single piece. This may reduce fragmentation of bone and mucosa and minimise the need for repeated instrumentation.

Early identification of the natural maxillary ostium is an important step in endoscopic sinus surgery. The design of the dissector permits controlled angulation under direct endoscopic vision, which can aid in consistent localisation of the ostium.

Incomplete uncinectomy and the so-called missed ostium sequence remain recognised limitations of conventional techniques [14–21]. By enabling en-bloc mobilisation prior to removal, this technique may help reduce the likelihood of incomplete resection when performed with an appropriate anatomical understanding.

Future Directions

Further evaluation through prospective and comparative studies would be useful to better define the role of this technique. Parameters such as operative time, completeness of

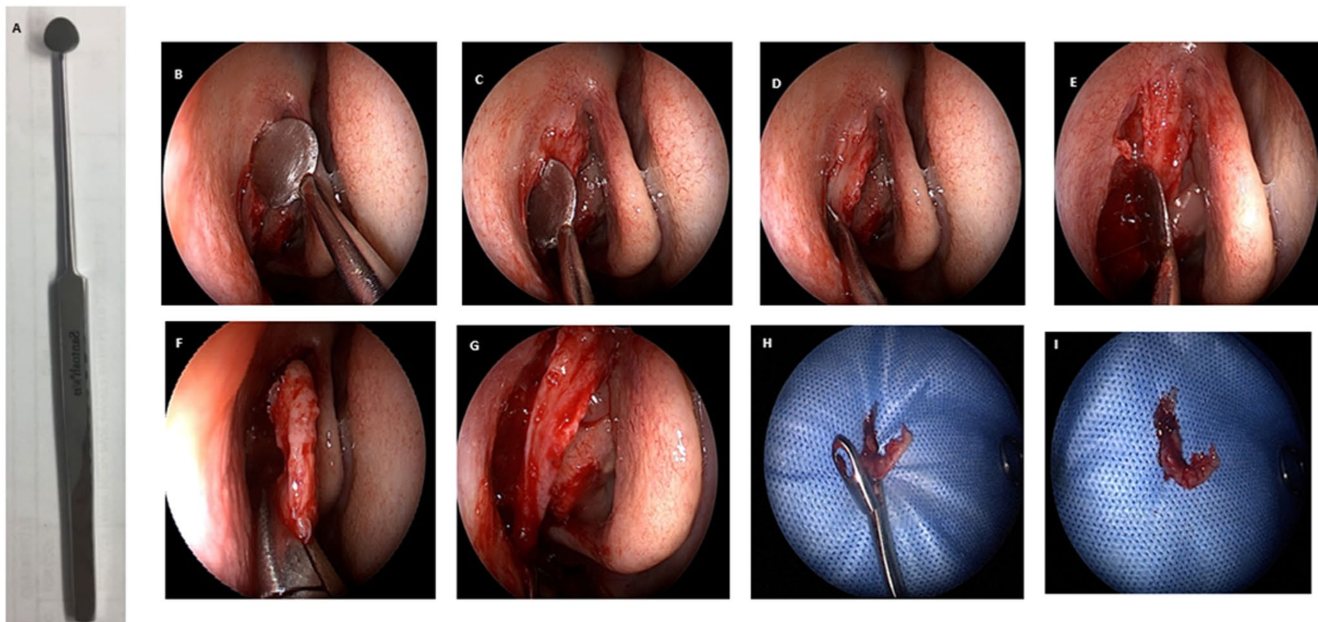

Fig. 2 **A**–**I** Stepwise en-bloc uncinate process dissection using Dr. Ahila's uncinate dissector. **A** Photograph of Dr. Ahila's uncinate dissector, demonstrating the dissecting tip and ergonomic handle. **B** Endoscopic view of the middle meatus showing initial engagement of the uncinate process using the tip of Dr. Ahila's uncinate dissector. **C** Medial dissection of the vertical portion of the uncinate process along its attachment to the lateral nasal wall under direct endoscopic visualization. **D** Continued controlled dissection of the uncinate process, with preservation of adjacent structures, including the lamina papyracea. **E** Identification of the natural ostium of the maxillary sinus during uncinate dissection, confirming adequate exposure. **F** Further dissection of the horizontal component of the uncinate process, maintaining mucosal integrity. **G** Complete mobilization of the uncinate process following en-bloc dissection, with clear visualization of the maxillary ostium. **H** Removal of the dissected uncinate process in toto using straight Blakesley forceps. **I** Retrieved specimen of the en-bloc excised uncinate process, demonstrating intact bone with overlying mucosa

Table 2 Observed surgical outcomes using Dr. Ahila's Uncinate Dissector

Parameter	Observation
Number of cases	~180
Anaesthesia	Predominantly local; selected cases under general anaesthesia
Completeness of uncinate removal	En-bloc removal achieved in the majority of cases
Identification of maxillary ostium	Early and consistent identification observed
Intraoperative complications	No major orbital or nasolacrimal duct injuries observed
Need for additional instruments	Minimal
Operative efficiency	Appeared streamlined; no formal time analysis performed

uncinate removal, and complication rates need objective assessment.

Additional studies incorporating postoperative endoscopic findings and radiological evaluation of sinus drainage may provide more robust evidence. Multicentric studies, including surgeons with varying levels of experience, could help assess reproducibility and the learning curve. Long-term follow-up focusing on synechiae formation, revision rates, and patient-reported outcomes would also be of value.

Conclusion

Uncinectomy remains a key and sometimes technically demanding step in functional endoscopic sinus surgery. Inadequate removal can lead to persistent disease and increase the risk of complications [22–25].

The technique described here offers a straightforward method for complete removal of the uncinate process using a controlled dissection approach. It facilitates consistent identification of the maxillary ostium and may help address some of the limitations associated with conventional techniques.

With appropriate training and familiarity, this technique can be incorporated into routine practice. Further studies are required to establish its comparative effectiveness and long-term outcomes.

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Nagalingeswaran Ahilasamy. Prepared the Manuscript: L. Jagadeesh Marthandam. Legends to Figures: Shunvrutha Sundar. Legends to Tables: Hanish S.

Declarations

Conflict of interest None declared.

Ethical approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Informed consent: Informed consent was obtained from individual participant included in the study.

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References

1. Fokkens WJ, Lund VJ, Mullol J et al (2012) European position paper on rhinosinusitis and nasal polyps 2012. Rhinology 50(Suppl 23):1–299
2. Abdel-Hak B, Gunkel A, Kanonier G, Schrott-Fischer A, Ulmer H, Thumfart W (1998) Ciliary beat frequency, olfaction and endoscopic sinus surgery. ORL J Otorhinolaryngol Relat Spec 60(4):202–205
3. Stammberger H, Hawke M (1993) Essentials of Functional Sinus Surgery, 2nd ed. Mosby, St. Louis
4. Simmen D, Jones N (2014) Manual of Endoscopic Sinus and Skull Base Surgery, 2nd ed. Thieme, Stuttgart
5. Bingham B, Wang RG, Hawke M et al (1991) The embryonic development of the lateral nasal wall from 8 to 24 weeks. Laryngoscope 101(9):992–7
6. Miranda C, Maranhão C, Arraes F et al (2011) Anatomical variations of paranasal sinuses on multislice computed tomography: what to look for? Radiol Bras 44(4):256–262
7. Islam RH, Osama AM, Ahmed MS (2015) Variations of lamina papyracea position from the endoscopic view: a retrospective computed tomography analysis. Int Forum Allergy Rhinol 5(3):263–270
8. Enrico MA (2019) Functional endoscopic sinus surgery: is it always a safe procedure? Otorhinolaryngol Head Neck Surg 4:1–5
9. Wormald PJ, McDonogh M (1998) The swing-door technique for uncinectomy in endoscopic sinus surgery. J Laryngol Otol 112(6):547–551
10. Singhania AA, Bansal C, Chauhan N et al (2012) A comparative study of two different uncinectomy techniques: swing-door and classical. Iran J Otorhinolaryngol 24(67):63–67
11. Bolger WE, Mawn C (2001) Analysis of the sinus lateralis for endoscopic sinus surgery. Ann Otol Rhinol Laryngol Suppl 110(186):1–14
12. Ali MJ, Murphy J, Wormald PJ et al (2015) Bony nasolacrimal duct dehiscence in functional sinus surgery: radiological study and discussion of surgical implications. J Laryngol Otol 129(3):35–40
13. Parsons DS, Stivers FE, Talbot AR (1996) The missed ostium sequence and the surgical approach to revision functional endoscopic sinus surgery. Otolaryngol Clin N Am 29:169–183
14. Buehring I, Friedrich B, Schaaf J, Schmidt H, Ahrens P, Zielen S (1997) Chronic sinusitis refractory to standard management in patients with humoral immunodeficiencies. Clin Exp Immunol 109(3):468–472
15. Park AH, Lau J, Stankiewicz J, Chow J (1998) The role of functional endoscopic sinus surgery in asthmatic patients. J Otolaryngol 27(5):275–280
16. Moses RL, Cornetta A, Roth M, Rosen MR, Keane WM (1998) Revision endoscopic sinus surgery: the Thomas Jefferson University experience. Ear Nose Throat J 77(3):190–202
17. Erminy M, Bonfils P (1998) Acute and chronic sphenoid sinusitis: review of the literature. Ann Otolaryngol Chir Cervicofac 115(3):106–116
18. Coste A, Idrissi F, Beautru R, Lenoir G, Reinert P, Manach Y et al (1997) Endoscopic endonasal ethmoidectomy in severe sinusitis of cystic fibrosis: mid-term results in 12 patients. Ann Otolaryngol Chir Cervicofac 114(4):99–104
19. Sabini P, Josephson GD, Reisacher WR, Pincus R (1998) The role of endoscopic sinus surgery in patients with acquired immune deficiency syndrome. Am J Otolaryngol 19(6):351–356
20. Halvorson DJ, Dupree JR, Porubsky ES (1998) Management of chronic sinusitis in the adult cystic fibrosis patient. Ann Otol Rhinol Laryngol 107(11 Pt 1):946–952
21. Senior BA, Kennedy DW, Tanabodee J, Kroger H, Hassab M, Lanza D (1998) Long-term results of functional endoscopic sinus surgery. Laryngoscope 108(2):151–157
22. Xi L, Lin C, Zhang R et al (2011) Uncinectomy through the anterior nasal fontanelle in endoscopic sinus surgery. J Craniofac Surg 22(6):2220–3
23. Vanclooster C, Jorissen M (1998) Endoscopic septal spur resection in combination with endoscopic sinus surgery. Acta Otorhinolaryngol Belg 52(4):335–339
24. Sg H, Zs R (2011) Diagnosis and management of silent sinus syndrome. American Academy of Ophthalmology
25. Hourany R, Aygun N, Della Santina CC et al (2005) Silent sinus syndrome: an acquired condition. AJNR Am J Neuroradiol 26(9):2390–2392

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