The Uncinate Bulla

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Summary: In this study a total of 175 coronal CT scans of the nasal cavity and paranasal sinuses have been investigated. The uncinate bulla was detected in 21 (11 male and 10 female) cases of 175 patients. Out of 21, 17 were bilateral while 4 were unilateral. The incidence of the uncinate bulla was found as 12%.

The uncinate process projects from the ethmoid bone to the ethmoidal process of the inferior nasal concha (Mafee, 1991; Williams, 1989) and helps in the closure of the opening of the maxillary sinus (Kuran, 1983; Romanes, 1981). The uncinate process bounded the infundibulum medially and the hiatus semilunaris inferiorly (Zinreich, 1987) (Fig. 1). Pneumatization of the uncinate process is called the uncinate bulla as an anatomic variation (Bolger, 1991) (Fig. 2). The detailed knowledge of the uncinate bulla can be obtained after using coronal CT (Bolger, 1991; Kennedy, 1988) because it cannot be seen by the direct and Waters radiographies.

In this study, the incidence of the uncinate bulla was investigated and relevant literature reviewed and compared.

Material and Method

A total of 175 coronal CT of the nasal cavity and paranasal sinuses were analysed. All the patients had the symptoms of chronic sinusitis. Scans were reviewed for the presence of an uncinate bulla. The age and sex of the patients and the diagnosis made at the time of the imaging were recorded. CT slices were performed at 4 mm intervals using the Toshiba 60 AX system (Table 1).

Results

The mean age of the patients was 33.4 years

(range 15-64). The uncinate bulla was detected in 21 (11 male and 10 female) cases of 175 patients (103 males and 72 females). Of these 21, 4 (2.3%) were unilateral while 17 (9.7%) were bilateral (Fig. 3, 4).

Fig. 1. The normal anatomy of the cavum nasi in the coronal plane. (ms) maxillary sinus, (m) middle concha, (i) inferior concha, (.,) infundibulum, (x) uncinate process.

Fig. 2. A coronal view shows the uncinus bulla and other structures of the cavum nasi. (arrow) uncinus bulla, (ms) maxillary sinus, (m) middle concha, (i) inferior concha, (s) septum nasi, (x) uncinus process.

Table 1. CT Protocol

Patient position :	Head hiperextended, pron position.
Slice thickness :	5 mm
Slice interval :	4 mm
Table position :	Coronal
Scan area :	Between glabella-dorsum sella
Dose parameters:	120 kVp, 400 mAs
Scan time :	4 sn
Window setting :	Window width 800–1000 H.Ü Window length 0–50 H.Ü

The incidence of the uncinus bulla was 12%. Distribution of other variations in 21 cases with the uncinus bulla was given Table 2.

Discussion

The knowledge of the anatomy of the lateral wall of the nose has improved since the advent of functional endoscopic sinus surgery and coronal computed tomographic (CT) imaging. Agger nasi cells, Haller cells, paradoxically bend middle turbinate, concha bullosa, enlarged ethmoidal bulla, uncinus bulla and secondary middle concha are recognized as anatomical variations on CT scans (Aykut, 1994; Bolger,

Fig. 3a. Direct coronal CT view of the uncinus bulla.

Fig. 3b. The schematic drawing of the same view. (arrows) uncinus bulla, (..) uncinus process, (m) middle concha, (i) inferior concha, (s) septum nasi.

1991; Calhoun, 1991; Khanobthamckai, 1991; Lloyd, 1990). Clinically, these anatomical variations are important, owing to their negative influence on sinus ventilation in selected cases of recurrent sinusitis and headaches (Stammberger, 1988).

In this study, the observed incidence of the uncinus bulla was 12%. This was noted by Kennedy and Zinreich (1988) as 0.4% and by Bolger *et al.* (1991) as 2.5%. The cause of the higher incidence in our study may be that all cases had symptoms of chronic sinusitis.

The bulla uncinus occurs due to excavation of the agger nasi cell into the most anterior-superior region of the uncinus process (Bolger, 1991). Pneumatization in this region potentially could impair the ventilation of the frontal sinus and ethmoid infundibulum, and hence the maxillary and anterior ethmoid sinus regions, might be expected in such cases

Fig. 4a. Another coronal CT view of the uncinate bulla.

Fig. 4b. The schematic drawing of the same view. (arrows) uncinate bulla, (..) uncinate process, (m) middle concha, (i) inferior concha, (s) septum nasi.

Table 2. Distribution of other variations in 21 cases with the uncinate bulla

Variations	Number of cases	
	UL	BL
Haller cells	5	7
Agger nasi cells	8	4
Concha bullosa	13	4
Enlarged ethmoid bulla	10	5
Tuberculum septi posterior	1	—
Curved uncinate process	1	2
Paradoxically bend middle turbinate	5	—
Secondary middle concha	—	2

UL: Unilateral, BL: Bilateral

(Bolger, 1990).

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