

가?<sup>1</sup>

2

CT 가  
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 103 , 가  
 . 103 26 , 21 ,  
 56 .  
 , 1.5 가 “ ”, 1.5  
 “ ”, 가 “ ” .  
 : 가 21 (21/26, 80.8%)  
 , 2 (2/26, 7.7%), 12 (12/21, 57.1%),  
 5 (5/56, 8.9%) 51 (91.1%),  
 9 (42.9%), 3 (11.5%) 가  
 18 (18/26, 69.2%), 1 (1/56, 1.8%)  
 ,  
 : 가 ,

가 , CT 가  
 . 가 , 가  
 , 가 CT  
 (1).  
 (Aspergillosis) 1885 Shubert  
 가 (2),  
 가 가  
 , 가  
 , AIDS 가 1993 1 1999 6  
 . (mucormycosis) CT  
 Caldwell - Luc  
 (3, 4). 103 ,  
 , 가 .

<sup>1</sup>  
<sup>2</sup> 2001 6 1 2001 10 27 . 21 , 26 , 56

3

( :42 ), 26 72

, 26 74 ( :50.9

), 1:2 가 .

:45 ), 1:1.2 .

CT Somatom Plus - S(Siemens Medical System, Erlangen, Germany)

5 mm

3 mm 5 mm

(bone window setting)

가

가 가

3가

가 1.5

가 1.5

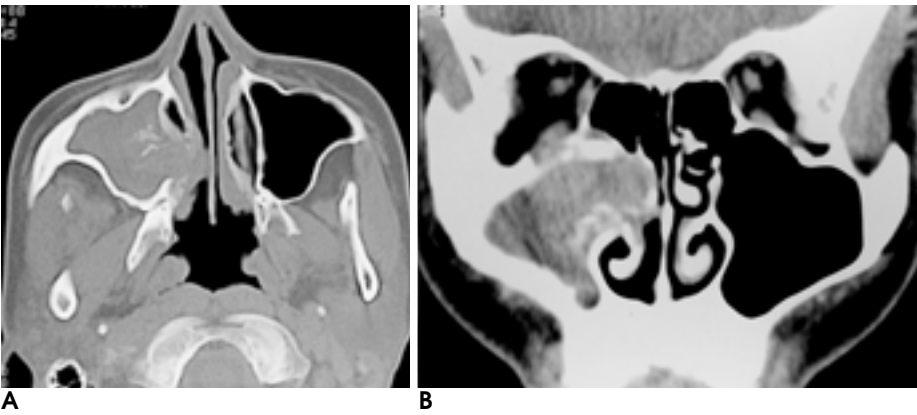
가

(Fig. 1) 21 (21/26, 80.8%)

(2/26, 7.7%) (Fig. 2A), 12 (12/21, 57.1%)

**Table.** Hyperostosis and Intrasinus Calcification in Unilateral Chronic Maxillary Sinus Disease

	Sinus Wall Thickening			Intrasinus Calcification
	None	Mild	>Moderate	
Fungal Sinusitis (N=26)	3(11.5%)	2(7.7%)	21(80.8%)	18(69.2%)
Inverted Papilloma (N=21)	9(42.9%)	12(57.1%)	( - )	( - )
Chronic Sinusitis (N=56)	51(91.1%)	5(8.9%)	( - )	1(1.8%)



**Fig. 1.** Moderate to severe wall thickening and calcification of the maxillary sinus in aspergillosis. Axial (A) and coronal (B) CT scans show moderate to severe wall thickening of the right maxillary sinus with nodular and linear intrasinus calcifications.



**Fig. 2.** Mild wall thickening of the maxillary sinus. Coronal CT scans show mild wall thickening of the maxillary sinus in aspergillosis(A), inverted papilloma(B), and non-fungal chronic sinusitis(C).



**Fig. 3.** No wall thickening of the maxillary sinus in non-fungal chronic maxillary sinusitis.

(Fig. 2B),  
(5/56, 8.9%) (Fig. 2C) (Table).  
51 (91.1%) 9 (42.9%)  
(Fig. 3).  
103 19 18  
(18/26, 69.2%) (Fig. 1),  
1 (1/56, 1.8%)

(mycoses) 1)  
(acute invasive fulminant disease), 2)  
(chronic invasive infection), 3)  
(noninvasive mycotic colonization = fungus ball),  
4) (allergic mycotic sinusitis)

4가  
가  
(Asper - gillosis),  
가 , Stamm -  
berger 13 340 90%  
(4).

(5),  
가  
(5).  
30 - 50 가  
9 , 17  
26 72 , 42  
(5),

CT  
(5 - 7).  
(5, 8).  
(4).

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CT  
(ethmomax -  
(5 - 9). Addlestone  
(10). (6)

78.4%

. Kopp  
56%

(8). Som (12)  
mycelium

calcium phosphate calcium sulfate,  
가  
75.7%  
(6).  
1 (1.8%) 가  
18 (69.2%)

CT 가  
“ ”

1. Som PM, Curtin HD. Chronic inflammatory sinonasal diseases including fungal infections. *Radiol Clin North Am* 1993;31:33-43
2. Stammberger H, Jakse R, Beaufort F. Aspergillosis of the paranasal sinuses X-ray diagnosis, histopathology, and clinical aspect. *Ann Otol Rhinol Laryngol* 1984;93:251-256
3. Robb PJ. Aspergillosis of the paranasal sinuses : A case report and historical perspective. *J Laryngol Otol* 1986;100:1071-1077
4. Stammberger H. Mycoses. In Stammberger H. *Functional endoscopic sinus Surgery*. 1st ed. Philadelphia:B. C. Decker, 1991:398-424
5. , , . 1988;24:534-540
6. , , , . : CT . 1995;32:545-550
7. , , .
8. Kopp W, Fotter R, Steiner H, Beaufort F, Stammberger H. Aspergillosis of the paranasal sinuses. *Radiology* 1985;156:715-716
9. Patel PJ, Kolawole TM, Malabarey TM, Hulailah A, Hamid F, Chakaki M. CT findings in paranasal aspergillosis. *Clin Radiol* 1992;45:319-321
10. Savetsky L, Walter J. Aspergillosis of the maxillary antrum. *Arch Otolaryngol* 1961;174:177-210
11. Yoon JH, Na DG, Byun HS, Koh YH, Chung SK, Dong HJ. Calcification in chronic maxillary sinusitis : Comparison of CT findings with histopathologic results. *AJNR Am J Neuroradiol* 1999;20:571-574
12. Som PM, Lidov M. The significance of sinonasal radiodensities : Ossification, calcification, or residual bone? *AJNR Am J Neuroradiol* 1994;15:917-922
13. Roithmann R, Shankar L, Hawke M, Chapnik J, Kassel E, Noyek A. Diagnostic imaging of fungal sinusitis : Eleven new cases and literature review. *Rhinology* 1994;33:104-110
14. Som PM. *Sinonasal cavity*. In Som PM, Brandwein M. *Head and Neck imaging*. 3rd ed. St. Louis: Mosby, 1996:163-173

## Hyperostosis of the Maxillary Sinus Wall in Aspergillosis: Is it a Characteristic Finding?<sup>1</sup>

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**Purpose:** To determine whether the wall thickening of the maxillary sinus is a characteristic finding in aspergillosis.

**Materials and Methods:** In 103 patients, including 26 with aspergillosis, 21 with inverted papilloma (IP), and 56 with unilateral chronic sinusitis, the thickness of the maxillary sinus wall was determined by CT scanning. All cases were proven pathologically, and patients with a history of previous surgery or bone destruction were excluded. Two neuroradiologists retrospectively reviewed the CT scans using bone window settings for sinus wall hyperostosis and the presence of intrasinus calcification. Thickening of the maxillary sinus wall was assessed visually in a semiquantitative manner, and graded as 'none' (absence of thickening), 'mild' (thickening of up to 1.5 times), or moderate to severe (over 1.5 times thicker than normal contralateral sinus wall at its thickest point).

**Results:** Moderate to severe wall thickening was found only in patients with aspergillosis (21/26, 80.8%). Mild wall thickening was seen in two patients with aspergillosis (2/26, 7.7%), in 12 of 21 with IP (57.1%), and in 5 of 56 with chronic maxillary sinusitis (8.9%). Most cases of chronic maxillary sinusitis (51/56, 91.1%), 9/21 IP cases (42.9%), and 3/26 cases of aspergillosis (11.5%) showed no thickening of the maxillary sinus wall. Calcifications were found in 18 patients with aspergillosis (69.2%), in no patient with IP (0%), and in one with chronic maxillary sinusitis (1.8%).

**Conclusion:** We suggest that 'moderate to severe' wall thickening of the maxillary sinus is the characteristic finding of aspergillosis. Although various sinonasal diseases can cause bone change, CT findings of hyperostosis of the maxillary sinus and intrasinus calcification are very helpful in differentiating fungal sinusitis from other types of chronic inflammatory lesions.

**Index words :** Paranasal sinuses, fungus  
Paranasal sinuses, CT  
Nose, neoplasms

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