

3

1

. . . . .

: 3

:

CT

115

3

, , ,

:

26.6(±7.9)mm,

26.4(±8.3)mm

(p=0.694).

가 26.2(±8.5)mm,

가 26.7(±

7.2)mm

(p=0.733).

20

(104/230,

45.2%)

(73/230, 31.7%)

(74/230, 32.1%)

(156/230, 67.9%)

6 (2.6%)

(211/230, 91.7%)가

(19/230, 8.3%)

26.2(±7.2)mm,

37.0(±6.0)mm

가

(p=0.000).

33

(14.3%)

:

18 - 32 mm

20

가

가

,

가

가

(16).

가

2000 1

2001 7

CT

(stylo -

hyoid syndrome)

(1 - 3).

, , ,

115

가 56

, 가 59

3

73

(4 - 6).

39.3

CT High Speed CTi Pro(GE Medical  
Systems, Milwaukee, U.S.A.) CT 65 ,

CT 50

CT

가

(anthropologic base line)

30 ° ; 120 °

3

1

2001 10 4

2001 12 6

1.5 mm

CT 가 5 mm  
3 CT CT Advantage  
Windows Workstation(GE Medical Systems, Milwaukee, U.S.A.) (Shaded surface display) (threshold value) 100 HU 300 HU

3 (Fig. 1). 가 (smooth type), (segmental type), (fragmental type), 30 (angular type) 가 (tapering), (clubbing) (Fig. 2).

SPSS t - 0.05



Fig. 1. Measurement of the length of styloid process by 3D reconstruction CT(arrow).

26.6(±7.9)mm, 가 26.4(±8.3)mm (p=0.694). 가 26.2(±8.5)mm, 가 26.7(±7.2)mm (p=0.733). 20 가 (Table 1).

Table 1. Mean Length of Styloid Process Obtained by Age Groups

Age(year)	No	Mean Length of Styloid Process(mm)	SD
1 - 10	8	12.5	8.4
11 - 20	11	22.7	8.1
21 - 30	11	27.6	5.3
31 - 40	24	27.5	6.0
41 - 50	23	27.4	4.4
51 - 60	25	28.9	8.5
61 - 70	9	29.4	6.7
71 -	4	28.3	8.2
Total	115	26.5	8.1

Table 2. Shape of Styloid Process

Shape of Styloid Process		No(n = 230)
General Appearance	smooth	53(23.1%)
	segmental	104(45.2%)
	fragmental	73(31.7%)
	angulated *	6(2.6%)
Shape of Tip	tapering	156(67.9%)
	clubbing	74(32.1%)

\*Angulated type of styloid process and other types of general appearance of it were analysed independently.

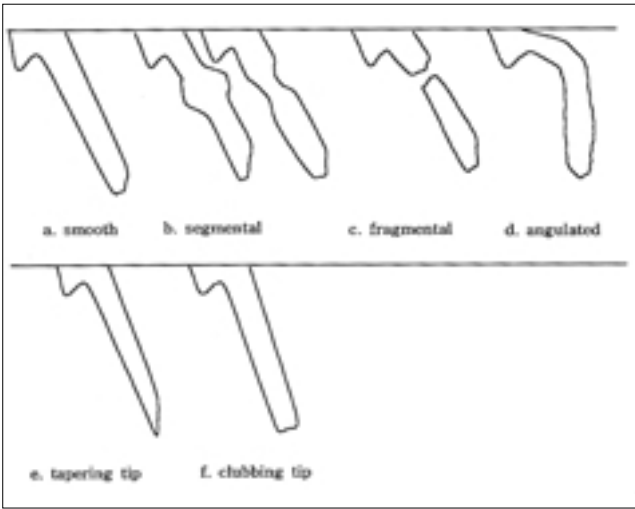


Fig. 2. Tracing taken from 3D reconstruction CT illustrating shape of styloid process.

(104/230, 45.2%)  
 (73/230, 31.7%)  
 (156/230, 67.9%)  
 6 (2.6%) (Table 2).

(211/230, 91.7%)가  
 (19/230, 8.3%)

가 26.2(±7.2)mm,  
 6.0)mm  
 (p=0.000) (Table 3).

33 (14.3%)  
 28.7(±7.9)mm,  
 25.9(±7.7)mm

(p=0.111).

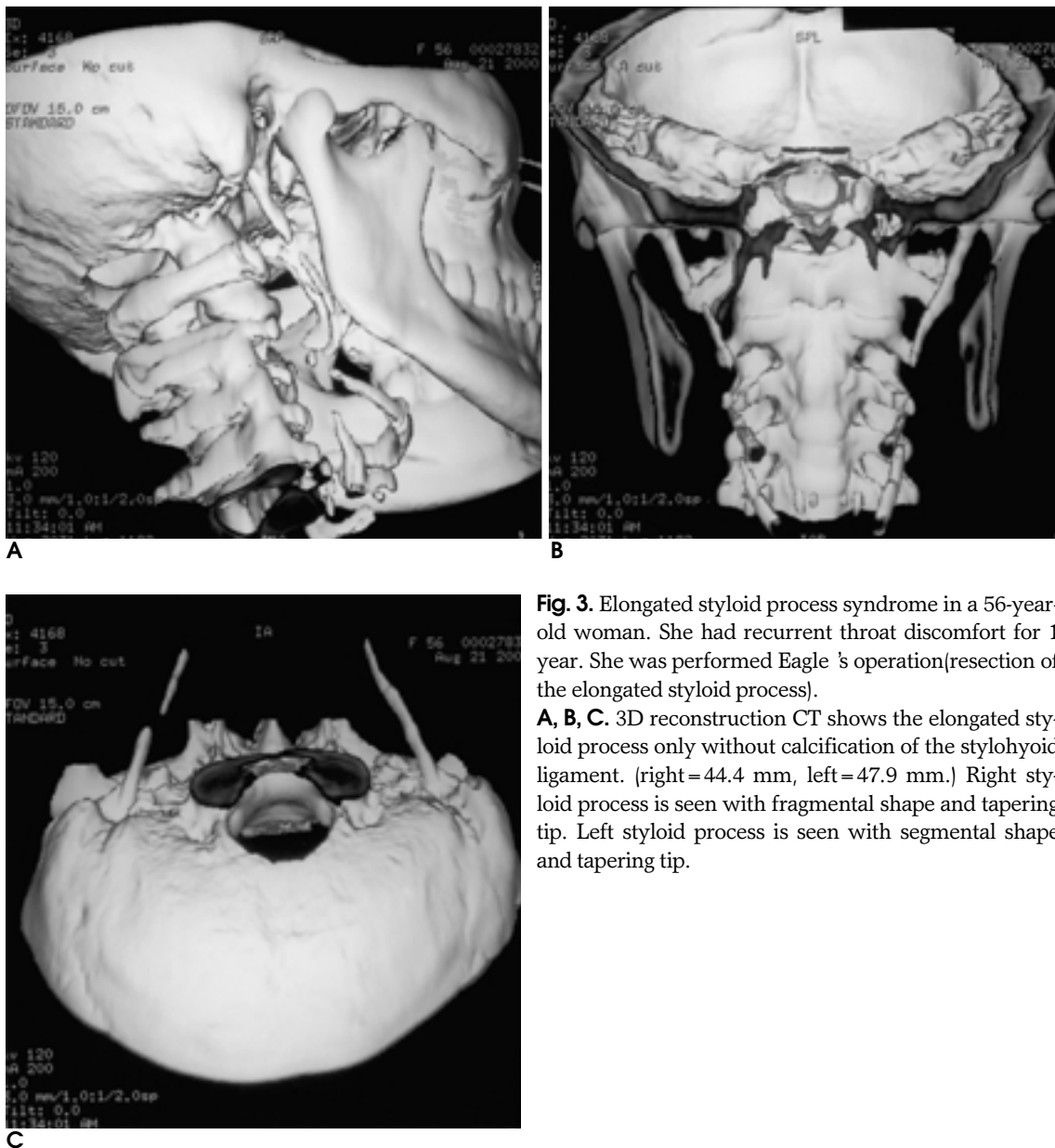
2

(second branchial arch)

**Table 3.** Relation Between Location of Tip and Length of Styloid Process on Axial Scan

Location of Tip of Styloid Process	No(n=230)	Length of Styloid Process
Between ICA and ECA	211(91.7%)	26.2(±7.2)mm
Medial to ICA and ECA	19 (8.3%)	37.0(±6.0)mm

Note. ICA = internal carotid artery  
 ECA = external carotid artery



**Fig. 3.** Elongated styloid process syndrome in a 56-year-old woman. She had recurrent throat discomfort for 1 year. She was performed Eagle's operation (resection of the elongated styloid process).

**A, B, C.** 3D reconstruction CT shows the elongated styloid process only without calcification of the stylohyoid ligament. (right = 44.4 mm, left = 47.9 mm.) Right styloid process is seen with fragmental shape and tapering tip. Left styloid process is seen with segmental shape and tapering tip.

Reichert 1 - 2 가  
 Reichert 가  
 Kaufman(1970)  
 (4). (6) 12% Paul(1986) (8)  
 가 35% 가 ,  
 (elongated type) 21% 2  
 45%, 31%  
 Paul  
 3  
 2 가  
 가  
 (16). 가  
 1662 Marchetti  
 Dwight(1907) (4) 3.0 - 5.0 1937 Eagle (5) 4  
 cm Eagle(1948) (5) 2.5 - 3 cm , Eagle 's syndrome,  
 Kaufman(1970) (6) X - (elongated styloid process syndrome)  
 29.9 mm, 29.5 mm 1961 (10)  
 가 18 - 32 mm Eagle (11), (12), (13)  
 가 (14)  
 가 5 가  
 3.5 - 4.2 cm  
 Eagle (5) 4%,  
 Kaufman (6) 28% 가  
 4% 가  
 20 가  
 4 - 50 6 - 70 가  
 가 1. 2.  
 Paul 가 3.  
 가 1.  
 2 2.  
 3. (7).  
 가가 , , ,  
 Lengele(1988) (9) , , ,  
 가 가 , 3 ,  
 가 가 ,  
 CT  
 가 CT  
 , CT 가 가 CT CT  
 CT CT CT  
 (15).  
 3 가

X -

(2). X -  
X -

가

CT

가

가

가

18 - 32 mm

20 가

가

가

가

가

CT

가 35 mm

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## Measurement of Normal Size of Styloid Process with 3D Reconstruction CT<sup>1</sup>

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**Purpose:** To measure the normal size of the styloid process using 3D (three-dimensional) reconstruction CT.

**Materials and Methods:** We retrospectively analyzed 3D reconstruction images obtained after coronal and axial CT scanning of the temporal bone or neck of 115 patients. The length and shape of both sides of the styloid process, the location of its tip, and calcification of the stylohyoid ligament were retrospectively analysed.

**Results:** The mean length of the styloid process was 26.6 ( $\pm 7.9$ )mm on the right side, and 26.4 ( $\pm 8.3$ )mm on the left, a statistically insignificant difference ( $p=0.694$ ). Its mean length was 26.2 ( $\pm 8.5$ )mm in men and 26.7 ( $\pm 7.2$ )mm in women, a statically in significant difference ( $p=0.733$ ). As for variation with age, mean length tended to increase until the third decade, but not beyond. Segmental type (104/230, 45.2%) and fragmental type (73/230, 31.7%) were more commonly seen in shape of styloid process, and tapering tip of styloid process (156/230, 67.9%) is more commonly seen than clubbing tip of it (74/230, 32.1%). The process was angulated in six cases (2.6%); its tip was more frequently located between the internal and external carotid artery (211 cases, 91.7%) than more medially (19 cases, 8.3%). In the former location, the length of the process was 26.2 ( $\pm 7.2$ )mm, and in the latter, 37.0 ( $\pm 6.0$ )mm. The difference was statistically significant ( $p=0.000$ ). Calcification had occurred in 33 cases (14.3%).

**Conclusion:** The length of a normal styloid process was 18 - 32 mm. There were no statistically significant differences between its two sides, or between the sexes. Length tended to increase until the third decade, but not beyond. Predominantly the tip was located between the internal and external carotid artery, though the process was longer when its tip was located medially.

**Index words :** Bones, measurement

Neck, CT

Computed tomography (CT), three-dimensional

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