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內文：

INTRODUCTION

- 呼吸道的不適會影響顱顏面的發展
- 上呼吸道的大小也是obstructive sleep apnea 的決定因素之一
- 有些paper指出呼吸道的不順暢是造成咬合不正與adenoid face的原因之一
- 醫師們需要一個可信的診斷工具來提供準確的資訊以釐清呼吸道的不順對於臉部發育過程的影響。
- 矯正醫師們目前最常用來診斷的工具為lateral Cephalogram
- 但是lateral Cephalogram是2D的，在表現3D結構時可能會產生失真，在放大倍數的差異，雙邊顱面結構的疊加等問題；此外，他也不能無法供我們看出呼吸道的截面積與體積。
- 近年來，CBCT成為這方面的診斷工具，他不會有放大倍數的差異，不同方向的線性角度的測量都是可信的，但是CBCT易取得性較低，也不是每個矯正的病患都會拍攝的。
- 因此，本篇paper想要探討的是CBCT與lateral Cephalogram之間對於成年人咽喉部位面積與體積的量測之關聯性。

METHOD AND MATERIALS

- 受測者：
 - ✓ CBCT和lateral Cephalogram在同一個禮拜內拍攝的
 - ✓ 排除有帶bite splint，顱顏面異常發育，做過正顎手術，或小於20歲的人員
- Anatomic structures used as boundaries of the pharyngeal airway:
 - ✓ Superior border: the edge of hard palate to the posterior of the pharynx (extension of ANS to PNS)
 - ✓ Inferior border : the tip of the epiglottis on a plane parallel to superior border
 - ✓ The plane perpendicular to the line 1/2 from PNS extending to the inferior border



(A) Sagittal cross section through mid sagittal plane shows the superior & inferior border of region of interest. (B) Axial cross section through epiglottis show area of region of interest at the level of epiglottis.

● 測量方法

Airway 體積是由 0.8 to 1 mm axial CBCT slices 的總和對應 vertical height of the pharyngeal airway determined from the lateral cephalogram 來決定。

Airway 的面積則由以下兩點來決定：

- ✓ 2D measurements; airway area of the region of interest from the lateral cephalogram;
- ✓ 3D measurements; airway volume over the same of region of interest from the CBCT scan, with all segmented 3D volumes in this study at the same scale and magnification for comparison.

● 統計工具

Bivariate correlation coefficient (r) was determined by Pearson correlation coefficient test to assess correlation between the area and the volume measurements. Mann Whitney U test was used for assessing the sex differences in 2D and 3D measurements. All statistical analyses were performed using SPSS software 18

Result

- ✓ 最終的 sample: 平均年齡 21.74± 2.63 歲, 共 23 位女性 12 位男性

Comparison of pharyngeal air way 3D and 2D measurements, between different sexes.

Sex	Volume in CBCT 3D	P *	Area in Cephalogram 2D	P *
Male	4429.8 (4198±1008)	0.007	380.8 (370.1±60.9)	0.005
Female	2565.2(2980±1134.5)		282.4(301.9±88)	

*Mann Whitney Test

Descriptive statistics of airway area and volume.

Measurements	n	Mean± SD	Max	Min	r	P value
Area mm ²	35	325.24±85.38	540.13	205.2100	0.831	0.000
Volume mm ³	35	3398.11±1226.85	5876.12	1835.23		

Discussion

- Lateral Cephalograms 是矯正醫師最常用來量測上呼吸道的工具
- 這篇報告的結果指出 lateral cephalogram 可以提供有效的資訊來判斷 severe

- restrictions and morphology of airway space。
- Aboudara *et al.* 指出lateral cephalograms and CBCT 在測量airway 的最大面積和體積是有moderately high ($r = 0.75$) correlation
 - Lenza *et al.* 也指出在量測upper part of the velopharynx兩者也有好的關聯性 ($0.8 < r < 0.9$)
 - 雖然有些人能對airway function 和他對臉部型態的影響有些許爭議，但是在很多anterior face height過長的 p't上發現他們有nasopharyngeal impairment 這同時也對dental function and esthetics有不良的影響。
 - Lateral cephalogram也提供麻醉醫師有效的評估病人是否插管困難，相較於clinical tools such as history and examination而言。
 - CBCT 相較於lateral cephalogram 可看到更多anatomical landmarks，量測出來的distances and angles也較準確，提供我們較正確的資訊來評估craniofacial complex 發育情形。
 - 有些paper指出resistance to airflow和 airway size and shape 都有關。而3D的影像則提供較精確且較有效的資訊以供我們評估。

RESULT

- 根據有限的sample，這篇報告指出lateral cephalogram 所量測出來的面積和CBCT所測量出來的體積有高度的相關。

題號	題目
1	<p>以下何者非CT scan優點?</p> <p>(A) Multiple- plane imaging and manipulation allowing anatomy / pathological conditions to be viewed in different planes</p> <p>(B) Low radiation dose compared to medical CT</p> <p>(C) Very fast scanning time</p> <p>(D) Soft tissue imaged in detail</p>
答案 (D)	出處：Essential of dental radiography and radiology, 4th edition, p.236
題號	題目
2	<p>以下關於cephalometric radiography 何者錯誤?</p> <p>(A) The main indications can be considered under two major headings----orthodontics and orthognathic surgery</p> <p>(B) To minimize the effect of magnification the focus-to-film distance should be greater than 1mm and ideally in the range 1.5-1.8 m</p> <p>(C) Position: the patient is positioned within the cephalostat, with sagittal plane of the head vertical and parallel to the image receptor and with the Frankfort plane horizontal. The teeth should not generally be in maximum intercuspation.</p>
答案 (C)	出處：Essential of dental radiography and radiology, 4th edition