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· 临床研究 ·

成年女性骨性Ⅱ类下颌后缩患者颞部与气道结构特征及相关性研究

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【摘要】 目的 探讨成年女性骨性Ⅱ类下颌后缩患者颞部与气道结构特征及其相关性, 为临床诊断及治疗提供参考。方法 本研究获得医院医学伦理委员会审批。选取成年女性骨性Ⅱ类下颌后缩均角患者40例为研究组, 骨性Ⅰ类均角患者60例为对照组, 拍摄锥形束CT(cone beam computed tomography, CBCT)并用三维测量软件测量, 分析颞部形态位置、上气道形态相关指标。结果 与骨性Ⅰ类患者相比, 骨性Ⅱ类下颌后缩患者颞前厚度、颞部基骨体积、总体积小, 颞角、颞凹陷、颞曲度、牙槽突面积大, 差异具有统计学意义($P < 0.05$); Gn-V线距离、Gn-H线距离、Po-NB距离、面角小, Y轴角大, 差异具有统计学意义($P < 0.05$); 上气道总体积、舌咽上界横径、矢状径小, 差异具有统计学意义($P < 0.05$)。骨性Ⅱ类下颌后缩患者颞部形态、位置与上气道形态相关性分析显示, 骨性Ⅱ类下颌后缩患者颞角与咽喉长度呈负相关($r = -0.277, P < 0.01$); Po-NB距离与咽喉长度呈负相关($r = -0.222, P < 0.05$); 颞高度($r = -0.261, P < 0.01$)、颞部基骨面积($r = -0.225, P < 0.05$)与咽喉上界横径呈负相关; 颞最小厚度($r = 0.245, P < 0.05$)、颞角($r = 0.249, P < 0.05$)、牙槽突面积($r = 0.213, P < 0.05$)与咽喉上界矢状径呈正相关; Gn-V线($r = 0.217, P < 0.05$)、Po-NB距离($r = 0.208, P < 0.05$)与舌咽上界横径呈正相关; 颞前厚度与咽喉上界矢状径呈负相关($r = -0.211, P < 0.05$); 颞凹陷与咽喉下界矢状径呈负相关($r = -0.237, P < 0.05$); 颞曲度与咽喉下界横径呈正相关($r = 0.231, P < 0.05$)。结论 骨性Ⅱ类下颌后缩患者颞部发育不足, 形态偏薄, 颞部矢状向位置偏后, 垂直向位置偏上, 舌咽气道相对狭窄。骨性Ⅱ类下颌后缩患者颞部形态、位置与上气道形态存在相关性。

【关键词】 骨性Ⅱ类; 骨性Ⅰ类; 下颌后缩; 成年女性; 锥形束CT; 颞部; 上气道; 错颌畸形; 正畸

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Study of the characteristics and correlation of the chin and airway in skeletal Class II adult female patients with mandibular retraction YUAN Yijiao^{1,2}, HAN Wen³, ZHEN Lei¹, ZUO Zhigang², ZHAO Yanhong².

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【Abstract】 Objective To explore the characteristics and correlation of the chin and airway in females with skeletal Class II mandibular retraction for reference for clinical diagnosis and therapy. **Methods** This study was approved by the hospital Medical Ethics Committee. Forty cases of skeletal Class II mandibular retraction adult females with average angle were selected as the research group, and sixty cases of skeletal Class I patients with average angle were selected as the control group. Cone-beam computed tomography (CBCT) images for all subjects were analyzed using three-dimensional modeling software. Measurements included the chin morphology, position, and upper airway morphology. **Results** Compared with skeletal Class I patients, patients with skeletal Class II mandibular retraction had smaller anterior chin thickness, base bone volume, chin total volume, and larger chin angle, chin depression, chin curvature, and alveolar area with statistically significant differences ($P < 0.05$). Gn-V, Gn-H, Po-NB distance, and facial angle were smaller, and the Y-axis angle was larger in patients with skeletal Class II mandibular retraction with statistically significant differences ($P < 0.05$). Upper airway total volume, transverse and sagittal diameter of the glossopharynx upper boundary were smaller in patients with skeletal Class II mandibular retraction with statistically significant differences ($P < 0.05$). The correlation analysis between the morphology and position of the chin and the morphology of the upper airway in patients with Class II mandibular retraction showed that there was a negative correlation between chin angle and laryngopharynx length in patients with Class II mandibular retraction ($r = -0.277, P < 0.01$). There was a negative correlation between Po-NB distance and palatopharyngeal length ($r = -0.222, P < 0.05$). Chin height ($r = -0.261, P < 0.01$) and basal bone area ($r = -0.225, P < 0.05$) were negatively correlated with the transverse diameter of the palatopharyngeal upper boundary. The minimum chin thickness ($r = 0.245, P < 0.05$), chin angle ($r = 0.249, P < 0.05$), and alveolar area ($r = 0.213, P < 0.05$) were positively correlated with the sagittal diameter of the palatopharyngeal upper boundary. Gn-V ($r = 0.217, P < 0.05$) and Po-NB distance ($r = 0.208, P < 0.05$) were positively correlated with the transverse diameter of the glossopharynx upper boundary. Anterior chin thickness was negatively correlated with the sagittal diameter of the laryngopharynx upper boundary ($r = -0.211, P < 0.05$). Chin depression was negatively correlated with the sagittal diameter of the laryngopharynx lower boundary ($r = -0.237, P < 0.05$). Chin curvature was positively correlated with the transverse diameter of the laryngopharynx lower boundary ($r = 0.231, P < 0.05$). **Conclusion** Patients with skeletal Class II mandibular retraction exhibit thinner chins. The sagittal position of the chin is backward, and the vertical position is upward. Patients with skeletal Class II mandibular retraction have a narrow glossopharyngeal airway. There is a correlation between the morphology and position of the chin and the morphology of the upper airway in patients with Class II mandibular retraction.

【Key words】 skeletal Class II; skeletal Class I; mandibular retraction; adult females; cone beam computed tomography; chin; upper airway; malocclusion; orthodontics

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颏部是人类面部生长中特有的解剖结构,其形态、位置对于协调面部比例起着至关重要的作用^[1]。颏部高度、突度超出正常限度时会影响面部美观^[2-3]。Linjawi等^[4]发现骨性II类患者牙槽骨及下颌联合高度较大,而骨性III类患者下颌联合突度较大。但目前相比于骨性I类患者,下颌后缩患者颏部的具体特征仍不明确。上气道形态受性别、年龄、颅面发育、颅颈姿势等多因素影响^[5-8]。上气道口咽段(腭咽及舌咽)为最狭窄的区域^[9]。研究发现骨性II类患者腭咽、舌咽、喉咽气道容积小于I类与III类患者^[10-11]。Rodrigues等^[12]认为上气道体积、最小截面积与矢状骨面型显著相关。对于颏部与上气道之间的相关性,以往研究大多

认为上气道形态与下颌骨位置有关^[13-15],但与颏部是否相关尚无明确结论。本研究探索成年女性骨性II类下颌后缩患者颏部形态位置、上气道形态特征并分析二者间相互关系,为骨性II类下颌后缩患者制订合理的正畸治疗计划提供参考。

1 资料和方法

本研究已通过天津医科大学口腔医院医学伦理委员会审查(审批号:TMUHEMEC20220807),并获得患者知情同意。

1.1 病例选择

筛选2020至2023年于天津医科大学口腔医院正畸科就诊的成年女性患者,根据纳入及排除标

准选择骨性Ⅱ类下颌后缩患者40例作为研究组,骨性Ⅰ类患者60例作为对照组,所有研究对象均具有锥形束CT(cone beam computed tomography, CBCT)及临床检查资料。

1.1.1 纳入标准 研究组:①女性,年龄 ≥ 18 岁;② $78.8^\circ \leq$ 蝶鞍点(S)-鼻根点(N)-上牙槽座点(A)之间夹角(SNA) $\leq 86.8^\circ$;③蝶鞍点(S)-鼻根点(N)-下牙槽座点(B)之间夹角(SNB) $< 76.2^\circ$;④上牙槽座点(A)-鼻根点(N)-下牙槽座点(B)之间夹角(ANB) $> 4.7^\circ$;⑤ $27.3^\circ \leq$ 下颌平面角(SN-GoGn) $\leq 37.7^\circ$ 。对照组:①女性,年龄 ≥ 18 岁;② $78.8^\circ \leq$ SNA $\leq 86.8^\circ$;③ $76.2^\circ \leq$ SNB $\leq 84^\circ$;④ $0.7^\circ \leq$ ANB $\leq 4.7^\circ$;⑤ $27.3^\circ \leq$ SN-GoGn $\leq 37.7^\circ$;⑥双侧磨牙尖牙中性关系。

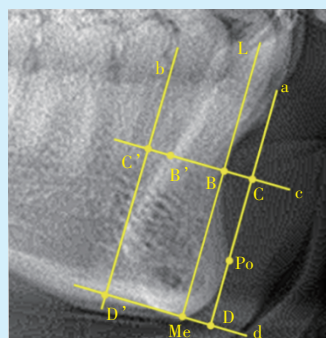
1.1.2 排除标准 ①有正畸、正颌治疗史;②颈部、上气道有外伤或手术史;③髌突骨皮质不连续,关节区有明显骨质改变;④有明显的生长发育异常及全身系统疾病;⑤除第三磨牙外有缺失牙、多生牙。

1.2 测量项目

所有患者拍摄CBCT(KaVo 3D eXam,德国),拍摄时取端坐位,眶耳平面与地面平行,光标定位线位于面中部,上下牙列轻咬合于牙尖交错位,平静呼吸,无吞咽、发声及其他任何运动。影像数据导入三维测量软件Invivo5(Anatomage,美国),测量以下指标。

1.2.1 颈部形态测量 连接下牙槽座点B与颏下点Me的直线为颏部长轴L,过颏部前后最突点分别作L的平行线a、b,过B、Me点分别作L的垂线c、d,c与颏部前后界分别交于点B、B',a、b、c、d形成一个矩形,4个顶点分别为C、C'、D、D' [16](图1)。

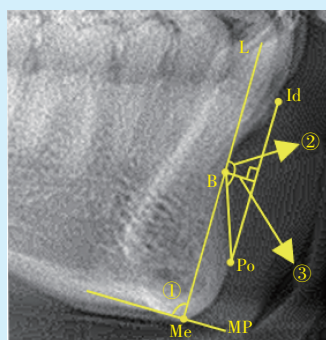
测量项目(图1~图4):①颏高度B-Me;②颏厚度C-C';③颏最小厚度B-B';④颏前厚度B-C;⑤颏后厚度B-C';⑥颏角MP-L:过Me作下颌平面MP,MP与L相交的后上角;⑦颏凹陷:连接下牙槽缘点Id和颏前点Po,测量点B到该线的距离;⑧颏曲度BPo-L:点B与点Po连线与颏长轴形成的钝角;⑨牙槽突面积、颏部基骨面积:CBCT正中矢状面上过点B作下颌平面的平行线,将下颌联合分为两部分,该平行线以上为牙槽突面积 S_1 ,平行线以下为颏部基骨面积 S_2 ;⑩颏部总体积、牙槽突体积、颏部基骨体积:下前牙釉牙骨质界为上界,过左右颏孔作水平面的垂线为左右界,测得颏部总体积,左右颏孔连线并平行于水平面的平面将颏



The straight line connecting B and Me is the L of the chin. Parallel lines a and b of L at the most protruding points of the chin were drawn, and vertical lines c and d for L passing through points B and Me were drawn. Line c intersects with the front and rear boundaries of the chin at points B and B', respectively. Lines a, b, c, and d form a rectangle with vertices C, C', D, and D', respectively. B: supramental; Po: pogonion; Me: menton; L: long axis

Figure 1 Line distance measurement of chin morphology in the lateral cephalogram of CBCT images

图1 CBCT头颅侧位片中颏部形态线距测量



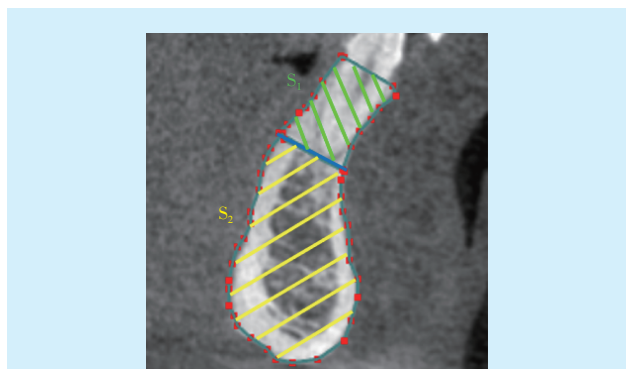
① Chin angle MP-L: a plane was created through Me, the upper rear corner where the MP intersects with L. ② Chin curvature BPo-L: an obtuse angle was formed by the line connecting point B and point Po with L. ③ Chin depression: the Id and Po were connected, and the distance from point B to this line was measured. B: supramental; Po: pogonion; Me: menton; Id: infradentale; MP: mandibular plane; L: long axis

Figure 2 Method of measurement with the chin angle, chin curvature, and chin depression in the lateral cephalogram of CBCT images

图2 CBCT头颅侧位片中颏角、颏曲度、颏凹陷测量方法

部分成两部分,该平面以上为牙槽突体积,平面以下为颏部基骨体积。

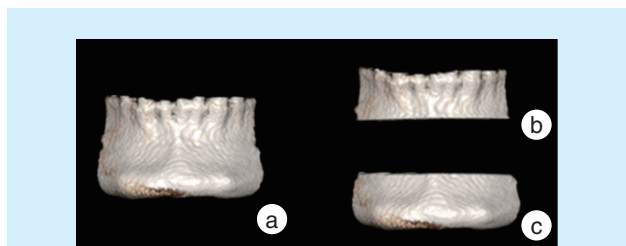
1.2.2 颈部位置测量项目 ①过蝶鞍点S作FH的平行线H,过S点作线H的垂线V,测量颏顶点Gn到两条线的垂直距离Gn-H, Gn-V [17]; ②Y轴角;



Green area S_1 : alveolar area. Yellow area S_2 : basal bone area of the chin

Figure 3 CBCT images showing sagittal area measurement of the alveolar and basal bone areas

图3 CBCT矢状向牙槽突及颏部面积测量



The enamel bone boundary of the lower front teeth is the upper boundary, and the perpendicular line passing through the left and right mental foramen forms a horizontal plane to act as both the left and right boundaries. a: the total volume of the chin was measured. The line connecting the left and right mental foramen is parallel to the horizontal plane and divides the chin into two parts. b and c: above this plane is the volume of the alveolar process (b), and below this plane is the volume of the base bone of the chin (c)

Figure 4 CBCT 3D reconstruction of chin volume measurement

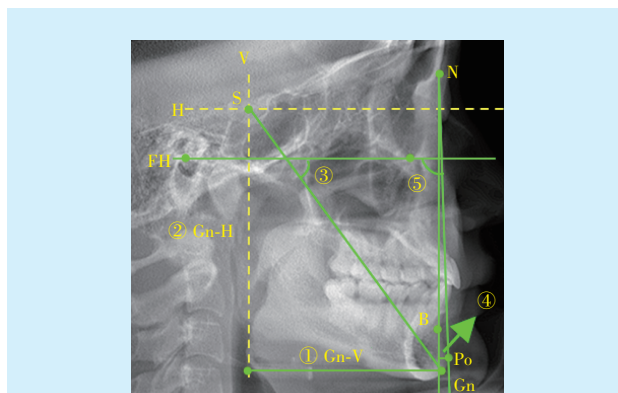
图4 CBCT三维重建下颏部体积测量

③颏部突度(Po-NB):连接鼻根点N与B,测量Po到NB的距离;④面角。详见图5。

1.2.3 上气道形态测量项目^[18] 测量上气道总长度H, 腭咽长度 H_1 , 舌咽长度 H_2 , 喉咽长度 H_3 (图6a), 上气道总体积, 最小截面积, 腭咽上界、舌咽上界、喉咽上界的最大矢状径L, 最大横径W及横截面积S(图6b、6c)。

1.3 统计学方法

使用SPSS 22.0软件进行统计分析。定量资料符合正态分布的数据用均数 \pm 标准差表示, 采用独立样本 t 检验进行比较, 不符合正态分布的数据用中位数(下四分位数, 上四分位数)表示, 采用Mann-Whitney U 非参数检验进行比较。采用Pear-



A line H was drawn parallel to the FH through S, and a perpendicular line V was drawn to line H through point S. The vertical distance from the Gn to the two lines was measured, namely ① Gn-V and ② Gn-H. ③ Y-axis angle: the lower front angle where the line connecting point S and Gn intersects with the FH. ④ Po-NB: the line where N and B connect, measuring the distance from Po to NB. ⑤ FH-Npo: the lower corner of the intersection between Npo and FH. S: sella; N: nasion; Po: pogonion; Gn: gnathion; B: supramental; FH: Frankfort horizontal plane

Figure 5 Chin position measurement in the lateral cephalogram of CBCT images

图5 CBCT头颅侧位片中颏部位置测量

son相关性系数检验各测量项目的相关性, 相关系数用 r 表示。 $P < 0.05$ 为差异具有统计学意义。

2 结果

2.1 骨性Ⅱ类下颌后缩患者与骨性Ⅰ类患者颏部形态比较

与骨性Ⅰ类患者相比, 骨性Ⅱ类下颌后缩患者颏前厚度、颏部基骨体积、总体积小, 颏角、颏凹陷、颏曲度、牙槽突面积大(表1), 差异具有统计学意义($P < 0.05$)。

2.2 骨性Ⅱ类下颌后缩患者与骨性Ⅰ类患者颏部位置比较

与骨性Ⅰ类患者相比, 骨性Ⅱ类下颌后缩患者Gn-V线距离、Gn-H线距离、Po-NB距离、面角小, Y轴角大(表2), 差异具有统计学意义($P < 0.05$)。

2.3 骨性Ⅱ类下颌后缩患者与骨性Ⅰ类患者上气道形态比较

与骨性Ⅰ类患者相比, 骨性Ⅱ类下颌后缩患者上气道总体积、舌咽上界横径、矢状径小(表3), 差异具有统计学意义($P < 0.05$)。

2.4 骨性Ⅱ类下颌后缩患者颏部形态、位置与上气道形态相关性分析

骨性Ⅱ类下颌后缩患者颏部形态、位置与上

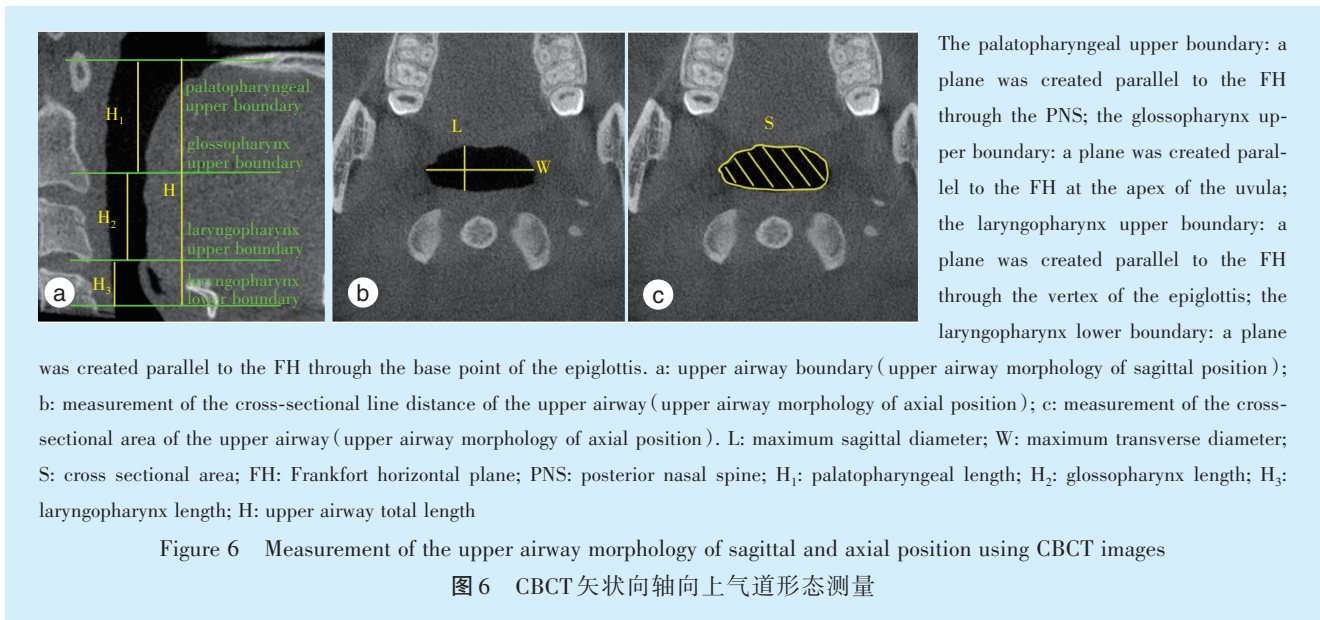


表1 骨性II类下颌后缩患者与骨性I类患者颈部形态比较

Table 1 Comparison of chin morphology between patients with skeletal Class II mandibular retraction and those with skeletal Class I

Measurement items	Skeletal Class I (n = 60)	Skeletal Class II (n = 40)	$\bar{x} \pm s/M(P_{25}, P_{75})$	
			t/Z	P
Chin height/mm	21.17 (20.21, 22.17)	20.84 (20.07, 22.42)	-0.584 ^a	0.559
Chin thickness/mm	14.56 ± 1.60	14.15 ± 1.33	1.337	0.184
Minimum chin thickness/mm	7.53 ± 1.12	7.49 ± 1.32	0.171	0.865
Anterior chin thickness/mm	4.32 (3.85, 4.45)	3.90 (3.56, 4.57)	-1.981 ^a	0.048
Posterior chin thickness/mm	10.15 ± 1.19	10.08 ± 1.10	0.308	0.758
Chin angle/°	80.52 ± 4.22	82.58 ± 4.31	-2.373	0.020
Chin depression/mm	3.34 ± 0.63	3.69 ± 0.79	-2.453	0.016
Chin curvature/°	161.15 (158.65, 163.68)	163.10 (161.53, 164.28)	3.160 ^a	0.002
Alveolar area/mm ²	60.31 (54.74, 72.87)	68.09 (59.49, 81.41)	2.111 ^a	0.035
Basal bone area/mm ²	228.19 ± 37.94	222.01 ± 38.21	0.796	0.428
Alveolar process volume/cm ³	7.08 ± 1.27	7.07 ± 1.19	0.048	0.962
Basal bone volume/cm ³	7.00 ± 1.20	6.12 ± 1.11	3.687	< 0.001
Chin total volume/cm ³	14.08 ± 2.02	13.19 ± 1.74	2.274	0.025

a: the statistical value Z using the Mann-Whitney U test

表2 骨性II类下颌后缩患者与骨性I类患者颈部位置比较

Table 2 Comparison of chin position between patients with skeletal Class II mandibular retraction and those with skeletal Class I

Measurement items	Skeletal Class I (n = 60)	Skeletal Class II (n = 40)	$\bar{x} \pm s/M(P_{25}, P_{75})$	
			t/Z	P
Gn-V/mm	58.42 ± 4.60	52.35 ± 5.99	5.425	< 0.001
Gn-H/mm	105.45 ± 5.08	101.90 ± 5.17	3.400	0.001
Y-axis angle/°	61.31 ± 2.52	63.09 ± 3.21	-3.099	0.003
Po-NB/mm	1.32 (0.44, 2.04)	0.51 (0.00, 1.63)	-2.299 ^a	0.021
FH-Npo/°	89.63 ± 2.54	86.21 ± 2.63	6.499	< 0.001

a: the statistical value Z using the Mann-Whitney U test

气道形态相关性分析显示,骨性II类下颌后缩患者颈角与喉咽长度呈负相关($r = -0.277, P <$

0.01), Po-NB距离与腭咽长度呈负相关($r = -0.222, P < 0.05$)。

表3 骨性Ⅱ类下颌后缩患者与骨性Ⅰ类患者上气道形态比较

Table 3 Comparison of the upper airway morphology between patients with skeletal Class II mandibular retraction and those with skeletal Class I

Measurement items			$\bar{x} \pm s / M(P_{25}, P_{75})$	
	Skeletal Class I (n = 60)	Skeletal Class II (n = 40)	t/Z	P
Palatopharyngeal length/mm	27.71 ± 3.15	27.20 ± 3.07	0.794	0.429
Glossopharynx length/mm	18.44 ± 4.50	19.18 ± 4.68	-0.789	0.432
Laryngopharynx length/mm	13.38 (12.01, 15.23)	13.83 (12.00, 15.35)	-0.039 ^a	0.969
Total length/mm	59.66 ± 3.63	59.88 ± 4.80	-0.268	0.789
Total volume/ cm ³	21.55 ± 6.01	18.66 ± 5.88	2.380	0.019
Minimum area/mm ²	212.70 ± 72.71	186.58 ± 82.50	1.667	0.099
Transverse diameter of the palatopharyngeal upper boundary/mm	36.55 ± 5.75	36.99 ± 5.82	-0.376	0.708
Sagittal diameter of the palatopharyngeal upper boundary/mm	23.42 ± 2.86	24.14 ± 3.41	-1.137	0.258
Cross-sectional area of the palatopharyngeal upper boundary/mm ²	615.35 (547.24, 712.92)	646.02 (551.39, 727.63)	0.830 ^a	0.406
Transverse diameter of the glossopharynx upper boundary/mm	29.05 ± 5.26	26.76 ± 5.52	2.084	0.040
Sagittal diameter of the glossopharynx upper boundary/mm	14.45 ± 3.51	12.56 ± 4.49	2.104	0.038
Cross-sectional area of the glossopharynx upper boundary/mm ²	359.01 (255.61, 430.87)	304.83 (170.33, 418.57)	-1.914 ^a	0.056
Transverse diameter of the laryngopharynx upper boundary/mm	31.02 ± 2.82	30.53 ± 3.46	0.781	0.437
Sagittal diameter of the laryngopharynx upper boundary/mm	13.97 ± 3.49	13.04 ± 3.64	1.287	0.201
Cross-sectional area of the laryngopharynx upper boundary/mm ²	344.59 ± 114.29	323.43 ± 105.31	0.936	0.352
Transverse diameter of the laryngopharynx lower boundary/mm	34.41 (33.11, 36.34)	35.23 (33.29, 36.54)	0.799 ^a	0.425
Sagittal diameter of the laryngopharynx lower boundary/mm	14.41 ± 2.32	14.28 ± 3.15	0.222	0.825
Cross-sectional area of the laryngopharynx lower boundary/mm ²	351.64 ± 81.10	353.11 ± 90.63	-0.085	0.932

a: the statistical value Z using the Mann-Whitney U test

骨性Ⅱ类下颌后缩患者颏高度($r = -0.261$, $P < 0.01$)、颈部基骨面积($r = -0.225$, $P < 0.05$)与腭咽上界横径呈负相关。颏最小厚度($r = 0.245$, $P < 0.05$)、颏角($r = 0.249$, $P < 0.05$)、牙槽突面积($r = 0.213$, $P < 0.05$)与腭咽上界矢状径呈正相关。Gn-V线($r = 0.217$, $P < 0.05$)、Po-NB距离($r = 0.208$, $P < 0.05$)与舌咽上界横径呈正相关。

颏前厚度与喉咽上界矢状径呈负相关($r = -0.211$, $P < 0.05$)。颏凹陷与喉咽下界矢状径呈负相关($r = -0.237$, $P < 0.05$)；颏曲度与喉咽下界横径呈正相关($r = 0.231$, $P < 0.05$)。

3 讨论

本研究下颌后缩患者颏前厚度小, 颈部基骨体积及总体积小, 提示下颌后缩患者颏部发育不足, 形态偏薄。下颌后缩患者颏角大提示颏部长轴相对下颌骨有一定的顺时针旋转, 颏凹陷大提示下牙槽缘点靠前, 下前牙相对唇倾, 以上特征都是颏部对上下颌骨矢状向关系不协调的代偿, 但这种代偿使本身不突出的颏部看起来更加后缩。Linjawi等^[4]测量不同骨面型患者下颌联合形态, 发现骨性Ⅱ类患者下颌联合突度小, 与本研究结果相似。下切牙唇向移动是代偿骨性Ⅱ类患者上下

颌骨矢状向不调的方式之一, 但下切牙在牙槽骨内的移动是有一定限度的, 超过极限则稳定性较差甚至出现牙周问题。颏厚度最小处接近下前牙根尖区牙槽骨厚度, 颏最小厚度小, 下切牙根尖处牙槽骨较薄, 牙齿移动范围小。

本研究中下颌后缩患者颏部位置偏后上, 呈顺时针旋转趋势。Po-NB距离与拔牙概率相关性较大^[19], Po-NB距离大时, 颏部靠前, 下切牙可做适当唇倾且不影响面型; 相反, Po-NB距离小, 颏部位置偏后, 需通过调整唇突度及下颌位置改善面下1/3的软组织形态, 拔牙概率较大。

本研究结果提示下颌后缩患者上气道狭窄, 尤其是舌咽气道相对较窄。以往研究发现骨性Ⅱ类患者上气道体积小于骨性Ⅰ类、Ⅲ类患者^[13, 20]。由于口咽气道缺乏骨性及软骨性结构支撑, 下颌后缩、下颌骨发育畸形等情况下更易出现气道塌陷, 进而影响呼吸功能。骨性Ⅱ类下颌后缩儿童在接受Twin-block矫治器治疗后, 咽气道容积及矢状径增大^[21]。对骨性Ⅱ类患者进行改良颏成形术, 术后舌骨向上向前移动, 上气道间隙增大^[22]。研究表明, 睡眠呼吸暂停患者经过颏成形术及牵张成骨治疗后气道明显扩张^[23]。因此对于下颌后缩的患者应在正畸治疗前评估上气道形态及功

能,并期望通过正畸、正颌等手段改善颌骨关系及气道形态。

以往研究发现下颌骨长度、高度、颞角等指标与上气道形态相关^[14,24]。安氏Ⅲ类患者下颌联合高度与腭咽气道高度正相关,与喉咽下界横径、舌咽及喉咽气道高度负相关^[14]。本研究中骨性Ⅱ类下颌后缩患者颞高度大,颞部基骨面积大者,腭咽上界横径小;颞最小厚度大、颞角大者,腭咽上界矢状径大。颞部靠前且越突出,舌咽上界横径越大。以上结果表明,颞最小厚度大、颞长轴顺时针旋转、颞部突出且位置靠前,对上气道腭咽及舌咽部分的扩大可能有积极作用。以往关于颞成形术与上气道的研究表明颞部向上,向前移动可增加口咽部气道体积^[25]。由此可知,颞部通过周围肌肉与上气道相关联,颞部形态及位置差异会影响上气道形态,造成上气道容积差异。

综上,本研究分析骨性Ⅱ类下颌后缩患者颞部、上气道形态及二者之间相关关系,旨在为下颌后缩患者制订正畸或正颌外科治疗计划提供参考依据,关注下颌骨、颞部位置的改变是否会对上气道形态产生不利的影响,以及治疗后的稳定性能否维持,以便制订合理的治疗方案。

【Author contributions】 Yuan YJ designed the study, collected and analyzed the data, wrote the article. Han W collected and analyzed the data, revised the article. Zhen L revised the article. Zuo ZG, Zhao YH designed the study, guided and critically reviewed the article structures. All authors read and approved the final manuscript as submitted.

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