

• 研究报告 •

上颌窦增龄变化的影像学分析

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[摘要] 目的:探讨上颌窦的增龄性变化规律。方法:选取鼻旁窦螺旋CT检查结果正常的患者540例(1 080侧),其中男、女各270例;年龄7~81岁,按年龄分为9组:A组7~12岁,B组13~17岁,C组18~20岁,D组21~24岁,E组25~28岁,F组29~35岁,G组36~40岁,H组41~65岁,I组>65~81岁,每组按性别又分为男、女两组,每组30例(60侧)。测量上颌窦容积和三维径线,计算气化系数。结果:男性和女性上颌窦容积、三维径线随年龄变化趋势基本一致,在7~20岁线性增大,13~17岁增长最快,18~20岁达峰值,21~28岁小幅下降,29~35岁出现第2次增长高峰,36~40岁大幅下降,41岁后达到稳定状态;气化系数各年龄组无差异。结论:上颌窦容积在青少年阶段随年龄变化,中老年阶段达到稳定状态,气化系数无增龄性改变。

[关键词] 上颌骨;多层螺旋CT;容积;气化系数

doi:10.13201/j.issn.1001-1781.2016.16.012

[中图分类号] R765 **[文献标志码]** A

The imaging analysis of the age-related changes on maxillary sinus

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Abstract Objective: The aim of this study is to investigate the age-related changes rules of maxillary sinus. **Method:** The 540 patients (1 080sides) with normal data of deputy sinus in spiral CT were enrolled, including 270 cases of male and female, age from 7 to 81 years old. They are divided into 9 groups according to the age: Group A at the age of 7-12 years old, Group B at the age of 13-17, Group C at the age of 18-20 years old, Group D at the age of 21-24 years old, Group E at the age of 25-28 years, Group F at the age of 29-35 years old, Group G at the age of 36-40 years old, Group H at the age of 41-65 years old, and Group I is more than 65 years old. By the gender, the patients in each group was divided into male and female groups. There are 30 cases in each group(60 sides). The volumes and the three-dimensional diameters of the maxillary sinus were measured, and the coefficient of gasification of them were calculated. **Result:** The maxillary sinus volume and 3 D lines have almost the same change trend along with the age between the male and female group; From 7 to 20 ages, they are increased linearly, 13 to 17 fastest-growing; 18 to 20 years old reached to peak; declined slightly in 21-28 years old, 29-35 a second growth peak, and 36 to 40 years old have fallen sharply, to reaching a steady state after 41 years old; The gasification coefficient has no difference among all groups. **Conclusion:** The volume changes with the age-related on maxillary sinus is in the adolescent stage. It reaches a steady state in the middle and old age stage, and gasification coefficient on maxillary sinus has no age-related changes among all groups.

Key words maxilla; multi-slice spiral CT; volume; gasification coefficient

上颌骨是人体骨骼发育过程中变化较大的面颅骨,形态和大小都随年龄发生变化。青少年阶段是人体骨骼发育变化的高峰期,研究上颌骨在这个时期的变化规律,对整形、美容及口腔正畸等有重要的价值。本研究通过影像学测量,重点分析青少

年上颌窦增龄变化的规律,旨在为临床和基础研究提供帮助。

1 资料与方法

1.1 临床资料

收集朝阳市中心医院2013-01-2015-06行鼻旁窦CT检查的540例(1 080侧)患者资料,所有患者上颌磨牙齐全,均除外牙周炎症、上颌骨肿瘤、手术、外伤骨折、营养不良、内分泌紊乱等病史。其中男、女各270例;年龄7~81岁,按年龄分为9

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组:A组 7~12岁,B组 13~17岁,C组 18~20岁,D组 21~24岁,E组 25~28岁,F组 29~35岁,G组 36~40岁,H组 41~65岁,I组 >65~81岁,每组按性别又分为男、女两组,每组 30例(60侧),组内年龄构成比无差异。

1.2 方法

检查方法:采用西门子 SOMATOM Definitionl 64 螺旋 CT 行鼻旁窦螺旋横轴位扫描,扫描范围自额窦上缘至下颌牙列下缘。电流 120 mA,电压 300 kV,层厚 5 mm,层间距 5 mm,螺距 1.375:1,矩阵 512×512。所有数据均进行后重建,重建层厚 0.6 mm,将重建数据传输至工作站进行后处理。

测量方法:在工作站浏览所有入选样本的影像资料,创建上颌窦三维图像,测量上颌窦容积、上颌窦三维径线等数据。①上颌窦容积测量:重建层厚与间隔为 0.6 mm,保证了结构的保真性。在 Volume(容积测量)窗口分割描画上颌窦各壁,测量上颌窦容积,由于软件的高度智能化,只需完整描画几个层面即可,测量阈值-1 024~100 HU。②上颌窦三维径线测量:调整图像呈标准听眶位,在三维窗口连续切片,在冠状位寻找最左点和最右点、最上点和最下点,测量最大左右径、上下径,在矢状位寻找上颌窦的最前点和最后点测量前后径。③气化系数的计算:以公式气化系数=测量容积/

估算容积(长×宽×高)计算上颌窦气化系数。上述所有测量均在骨窗条件下进行,由二名医师共同完成。

1.3 统计学处理

采用 SPSS14.0 统计软件,不同性别的同龄组间各项指标对比采用 t 检验;同一性别的上颌窦气化系数增龄性对比采用单因素方差分析。P<0.05为差异有统计学意义。

2 结果

男性和女性测量数值见表 1。除 A、G 两组外,其他各组上颌窦容积、三维径线比较,男性均大于女性(P<0.05);气化系数均无差异(P>0.05)。男性和女性上颌窦容积、三维径线的增龄变化趋势基本一致:A组(7~12岁)与 B~F组(13~35岁)比较,差异有统计学意义(P<0.05);与 G~I组(36~81岁)比较,差异无统计学意义(P>0.05)。B~F组(13~35岁)与 G~I组(36~81岁)比较,差异有统计学意义(P<0.05)。各组气化系数比较,差异无统计学意义(P>0.05)。

540例(1 080侧)上颌窦中,上颌窦容积和三维径线增龄变化见图 1、2。13~17岁出现第 1 个增长高峰,女性 18~20岁达峰值,21岁后上颌窦容积随年龄增长逐渐缩小,29~35岁出现第 2 次增长高峰,男性达峰值,36~40岁迅速下降,41岁后达到稳定状态。

表 1 9组上颌窦三维径线、上颌窦容积及气化系数比较

组别	上颌窦容积/cm ³		左右径/mm		前后径/mm		上下径/mm		气化系数	
	男	女	男	女	男	女	男	女	男	女
A组	13.75±3.78	13.81±4.33	27.93±4.47	27.98±3.21	32.95±4.75	33.90±5.24	36.29±3.68	34.50±4.35	0.41±0.08	0.42±0.07
B组	19.89±6.59	16.46±4.58	30.94±4.90	28.84±3.78	41.45±6.52	38.10±4.71	39.70±4.41	36.18±5.54	0.39±0.07	0.40±0.09
C组	20.83±6.77	17.30±5.61	30.03±3.86	28.45±4.58	41.29±5.16	38.01±4.87	39.81±5.37	38.63±4.69	0.41±0.07	0.41±0.10
D组	18.25±7.06	16.43±5.54	28.04±4.12	26.84±4.93	39.79±4.92	38.77±5.13	38.32±4.82	37.53±5.73	0.41±0.09	0.41±0.07
E组	16.74±6.25	15.18±5.64	27.14±5.10	26.63±5.14	38.44±5.61	37.91±5.29	37.60±4.63	37.36±6.21	0.41±0.08	0.42±0.08
F组	21.55±5.87	16.09±5.26	31.51±5.72	28.27±4.67	42.57±4.79	38.53±4.38	39.37±5.21	36.34±4.75	0.40±0.08	0.41±0.07
G组	14.50±4.72	13.76±4.29	25.89±6.17	25.52±5.36	36.88±5.23	36.35±5.14	35.86±5.48	34.73±4.23	0.41±0.07	0.41±0.08
H组	14.06±5.33	12.61±4.82	25.91±3.69	24.54±4.96	36.95±5.14	34.68±5.63	35.57±6.14	35.01±5.42	0.41±0.07	0.42±0.08
I组	14.47±5.33	12.07±4.59	24.49±4.53	23.98±3.43	37.01±4.72	35.30±3.82	37.04±5.21	35.45±4.83	0.42±0.09	0.40±0.09

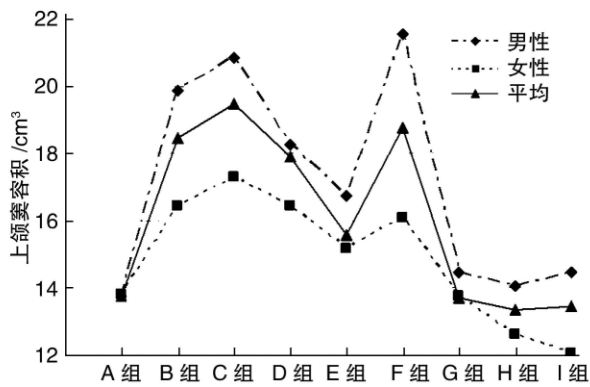


图 1 上颌窦容积增龄变化曲线图

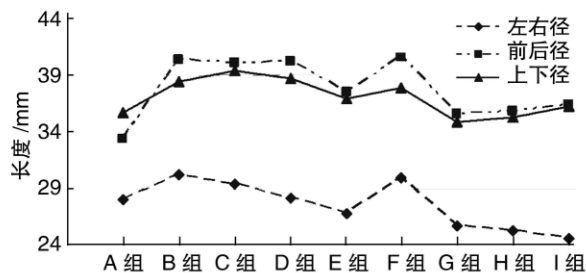


图 2 上颌窦三维径线增龄变化曲线图

3 讨论

上颌骨是人体最大的面颅骨,和下颌骨构成面部支架,参与组成口腔、眼眶、鼻腔等。上颌骨的发育不仅影响面容,还会影响呼吸、消化等功能,因此研究上颌骨的发育具有重要意义。

儿童、青少年阶段是人体骨骼生长最旺盛的时期,上颌骨在 0~3 岁出现第 1 次发育高峰^[1-2]。不同部位的骨骼发育有很大差异,上颌骨发育的最大特点是窦腔气化,正常国人上颌窦在 7 岁时气化率达 100%^[23]。7~12 岁上颌骨出现第 2 次发育高峰^[1-2],这个时期上颌窦气化开始加速,有研究结果显示上颌窦容积女性大于男性^[1],但本组男女性上颌窦容积无差异($P>0.05$),可能与本地儿童发育提前有关。本研究显示 12 岁后,除 G 组(36~40 岁)外,其他各组男性均大于女性($P<0.05$),但两性随年龄变化的趋势基本一致,即 13~20 岁上颌窦气化出现第 1 个发育高峰,21 岁后出现小幅下降,在 31~35 岁又出现第 2 个高峰,36~40 岁开始下降,41 岁后达到比较稳定的状态。由此可见上颌骨的发育是个复杂的过程,分析这种变化趋势,可能与以下因素有关:影响骨骼发育的因素很多,包括遗传、运动、激素、营养等^[3-4]。青春期是性激素、甲状旁腺激素等与骨发育相关的激素波动较大的时期,对骨重建产生重要影响^[5],这可能是上颌窦容积随年龄变化,在青春期出现 2 个生长高峰的重要原因,具体机制有待进一步研究。上颌窦增长包括鼻上颌复合体内侧面骨吸收、外侧面骨沉积,青

春期骨质代谢活跃,一直处于活动状态,上颌窦窦腔亦随之不断变化,直至青春期结束(40 岁),出现峰值骨密度后,这种增长变化可能也随之结束。

上颌窦的形态与人种、性别、营养运动等相关^[6],并且与炎症、磨牙脱落等因素有关。Jun 等^[7]认为随年龄增长,上颌窦的形态和位置均发生变动。上颌窦的三维径线长度是变化的,本组上颌窦三维平面各径线的增龄性变化趋势与上颌窦容积相似,但气化系数稳定,波动于 0.39~0.42。气化系数反映的是在 X 轴、Y 轴、Z 轴一定的前提下上颌窦的容积,气化系数越大,说明上颌窦越饱满。推测上颌窦在青少年阶段虽然体积和形态在不断变化,但保持一定的气化比例,在中老年阶段也保持这个比例。

上颌窦容积的增龄性变化对青少年整容、上颌骨手术具有重要参考价值,手术应当充分考虑上颌骨的动态变化,因为这不但不影响上颌骨发育,还直接影响面容的美观。另外,对青少年因上颌窦窦腔过大引起的阻塞性睡眠呼吸暂停低通气综合征^[8]的诊治有一定的参考价值,应充分考虑上颌窦容积增龄变化对阻塞性睡眠呼吸暂停低通气综合征的影响。

影响上颌窦发育的因素较多^[9],辽宁朝阳地区地处辽、冀、蒙三省交界区,杂居着汉、蒙、回、满、朝鲜族等多个民族,青少年骨骼发育有自己的特点。我国民族众多,本研究对其他相似地区杂居人口的生理解剖研究有借鉴意义。

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(收稿日期: 2016-05-03)

国产便携式睡眠监测仪对阻塞性睡眠呼吸暂停低通气综合征的诊断价值

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[摘要] 目的: 通过比较国产便携式睡眠监测仪(YH600B)和PSG同步睡眠监测结果的一致性, 评价YH600B的临床应用价值。方法: 应用PSG和HY600B对119例睡眠打鼾患者同步进行整夜睡眠监测, 分析PSG和YH600B的监测结果, 分别比较两种检查设备的AHI和LSaO₂之间的相关性, Bland-Altman法分析结果的一致性, ROC曲线计算YH600B最佳AHI阳性临界点及其对应的灵敏度和特异度。结果: ①YH600B和PSG测定的AHI值和LSaO₂均呈高度正相关($r=0.981, 0.882, P<0.05$); ②Bland-Altman分析显示两种检查方法测得AHI结果高度一致; ③ROC示YH600B最佳AHI界值为7.25, 其对应的灵敏度为98.1%, 特异度为92.2%。曲线下面积为0.9923。结论: YH600B监测指标与PSG高度一致, 对诊断阻塞性睡眠呼吸暂停低通气综合征具有较高价值。

[关键词] 睡眠呼吸暂停低通气综合征, 阻塞性; 便携式睡眠监测仪; 多道睡眠描记术

doi: 10.13201/j.issn.1001-1781.2016.16.013

[中图分类号] R563.8 [文献标志码] A

Clinical value of a domestic portable monitoring system for the diagnosis of obstructive sleep apnea syndrome

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Abstract Objective: The aim of this study is to evaluate the clinical value of a portable monitoring system (YH600B) in OSAHS by comparing the consistency of overnight sleeping data recorded by polysomnography and YH600B. **Method:** One hundred and nineteen snoring patients underwent one-night polysomnography (PSG) and YH600B simultaneously. The measured data by the two methods were compared to analysis their correlation, including AHI and LSaO₂. The Bland Altman plots was used to assess the consistency between PSG and STD. Sensitivity and specificity comparisons were plotted graphically using receiver operating characteristic (ROC) curve analysis. **Result:** All cases were well tolerated the procedure. ① AHI and LSaO₂ measured by the two techniques have strong correlation ($r=0.981, r=0.882, P<0.05$, respectively). ② Bland Altman analyses showed strong agreement between AHI values from the YH600B and PSG recordings. ③ the ROC-curve showed that AHI cut-off value was 7.25, area under the curve was 0.9923, sensitivity was 98.1%, and specificity was 92.2%. **Conclusion:** These data suggest that YH600B have highly consistency with PSG, and YH600B is accurate in the application of the diagnosis of OSAHS.

Key words sleep apnea-hypopnea syndrome, obstructive; portable monitoring system; polysomnography

阻塞性睡眠呼吸暂停低通气综合征(OSAHS)是导致心血管疾病的病因之一^[1]。PSG是诊断OSAHS的金标准,但由于监测设备昂贵、操作复

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