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·论 著·

三维超声OmniView在妊娠早期诊断鼻骨缺失的临床价值

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【摘要】 **目的** 探讨三维超声OmniView在早孕期诊断胎儿鼻骨缺失中的应用价值。**方法** 选取300例早孕期来我院行常规超声检查的孕妇,按胎儿头臀径分为四组,分别为45~54 mm组65例、55~64 mm组74例、65~74 mm组85例、75~84组76例,应用二维及三维超声OmniView对其鼻骨进行观察及图像分析,对比各组间鼻骨的显示率,并重点对鼻骨缺失者进行图像分析。**结果** ①各组三维超声OmniView对胎儿鼻骨的显示率均高于二维超声,除55~64 mm组(显示率相同)外,各组两者比较差异无统计学意义(P>0.05);②三维OmniView对胎儿鼻骨的总显示率稍高于二维超声,但两者比较差异无统计学意义(P>0.05)。其中6例二维超声在颜面正中矢状面未探及鼻骨,三维超声OmniView可通过颜面部正中矢状面描画解剖线,获取鼻后三角冠状切面和其相垂直的横断切面,显示了胎儿鼻骨。另外7例二维超声及三维OmniView均未显示胎儿鼻骨,诊断为鼻骨缺失。**结论** 三维超声OmniView操作简单,能在二维超声的基础上提供更多鼻骨的诊断信息,减少对操作者技术和经验的依赖,为妊娠早期诊断鼻骨缺失提供了新的思路和方法,是二维超声检查的重要补充。

【关键词】 三维超声;OmniView;胎儿;鼻骨缺失
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Clinical value of three-dimensional ultrasound with OmniView in the diagnosis of absence of nasal bone in early pregnancye. *LIANG Yao-yuan, MA Xiao-yan, HUANG Yuan-ming, CAO Jian-fa. Department of Ultrasound, Guangdong Women and Children's Hospital, Guangzhou 510010, Guangdong, CHINA*

【**Abstract**】 **Objective** To investigate the clinical application value of OmniView (a new three-dimensional ultrasound technology) in the diagnosis of absence of nasal bone in early pregnancy. **Methods** Three hundred pregnant women who underwent routine ultrasound examination in our hospital were enrolled in the study, which were divided into four groups according to the fetal crown rump length: 45~54 mm (65 cases), 55~64 mm (74 cases), 65~74 mm (85 cases), and 75~84 mm (76 cases), respectively. The nasal bone was observed and analyzed of by applying two-dimensional ultrasound and three-dimensional ultrasound with OmniView. The display rates of nasal bone were compared between groups, and the images of absence of the nasal bone were analyzed. **Results** ① The display rate of each group of OmniView for fetal nasal bone was slightly higher than that of two-dimensional ultrasound (except 55~64 mm group, with the same display rate), but there was no statistically significant difference (P>0.05). ② The total display rate of OmniView on fetal nasal bone was slightly higher than that of two-dimensional ultrasound, with no statistically significant difference (P>0.05). For two-dimensional ultrasound, 6 cases does not show the fetal nasal bone in the median sagittal plane on the face. However, for the 6 cases, OmniView can draw the anatomical lines on referenced facial sagittal plane, obtain the retronasal triangle coronal and its perpendicular to the axial plane, then display the fetal nasal bone. Besides, 7 cases did not display the fetal nasal bone in both two-dimensional ultrasound and OmniView, which were diagnosed as nasal bone a bsence. **Conclusion** Three dimensional ultrasound with OmniView has the advantage of simple operation, and can provide more diagnostic information of the nasal bone based on two-dimensional ultrasound, as well as reduce dependence on operator's skill and experience. It provides a new idea and method for the early diagnosis of absence of nasal bone and serves as an important supplement of two-dimensional ultrasonography.

【**Key words**】 Three-dimensional ultrasound; OmniView; Fetus; Absence of nasal bone

观察胎儿鼻骨是产前超声诊断胎儿畸形的重要组成部分,尤其是妊娠早期鼻骨缺失与多种异常呈密切相关性,特别和非整倍体胎儿染色体异常的关系密切,其对诊断21-三体综合征具有重要意义[1-3]。一直以来,采用二维超声诊断鼻骨缺失是以胎儿颜面的正中矢状面为最佳诊断切面,凭

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此切面诊断鼻骨发育不良或缺如。但当胎儿体位不配合，无法获取颜面正中矢状面时，则需要其他切面做补充，而鼻后三角切面被认为是最有效的补充切面[4]，但由于受胎位及检查者技术和经验的影响，往往二维超声较难显示鼻后三角切面。三维超声OmniView（自由解剖成像）是一种新的三维超声后处理技术，可对容积数据任意方向和角度进行切割，所获图像是经过切割线且垂直于A的平面。因而只要有完整的容积数据就能获取任意方向和角度的平面，这样就大大方便了检查者对于在二维超声上相对难显示的切面进行显像观察[5-6]。目前国内外研究应用三维超声OmniView对早孕期胎儿鼻骨缺失的研究较少，因此本研究应用三维超声OmniView对孕早期胎儿鼻骨进行成像观察，比较分析其和二维超声对鼻骨的显示率，并对鼻骨缺失胎儿图像观察和分析，探讨其评价妊娠早期胎儿鼻骨缺失的应用价值。

1　资料与方法

1.1　一般资料　选取2013年1~12月妊娠早期在我院行产前超声筛查的孕妇300例，既往无不良妊娠史，胎儿头臀径（Crown rump length，CRL）45~84 mm，孕妇年龄19~39岁，中位年龄33岁，均为单胎妊娠。根据胎儿CRL分为：45~54 mm组65例、55~64 mm组74例、65~74 mm组85例、75~84组76例。所有孕妇均追踪至出生后3个月内情况，对选择终止妊娠者随访引产后外观情况和病理尸解结果。

1.2　仪器与方法

1.2.1　仪器　采用GE Voluson E8三维超声诊断仪（使用实时4D容积探头，经腹部容积探头频率3~6 MHz，经阴道容积探头频率为6~12 MHz）。

1.2.2　方法　先进行常规筛查，依次扫查胎儿头颅、颜面、胸部、腹部、四肢及脐带、胎盘及羊水，测量CRL和颈项透明层（Nuchaltranslucens，NT）、胎盘厚度及羊水深度。接着启动三维超声扫描模式，调整取样框大小并将取样框置于胎儿颜面部，选择合适的扫查角度后，按RUN键经颜面矢状切面进行容积数据采集，并将获取的三维容积数据存入硬盘，如图像不满意或胎儿运动明显时，嘱孕妇改变体位或适当活动后再重新采集，直至获取满意的完整容积数据。接着以颜面部矢状面为参考A平面，激活容积对比成像（Volume contrast imaging，VCI）功能，厚度为1~2 mm，以改善容积对比分辨力。将图像调整至水平左向颜面正中矢状切面，使用2D伪彩模式，调节亮度及对比度，使图像清晰，对比分明。启用三幅图显示模式，在A平面上沿上额骨水平画第1线（黄线），显示鼻后三角冠状面。沿上腭水平部垂直第1线画第2线，显示鼻骨的横断面，见图1。

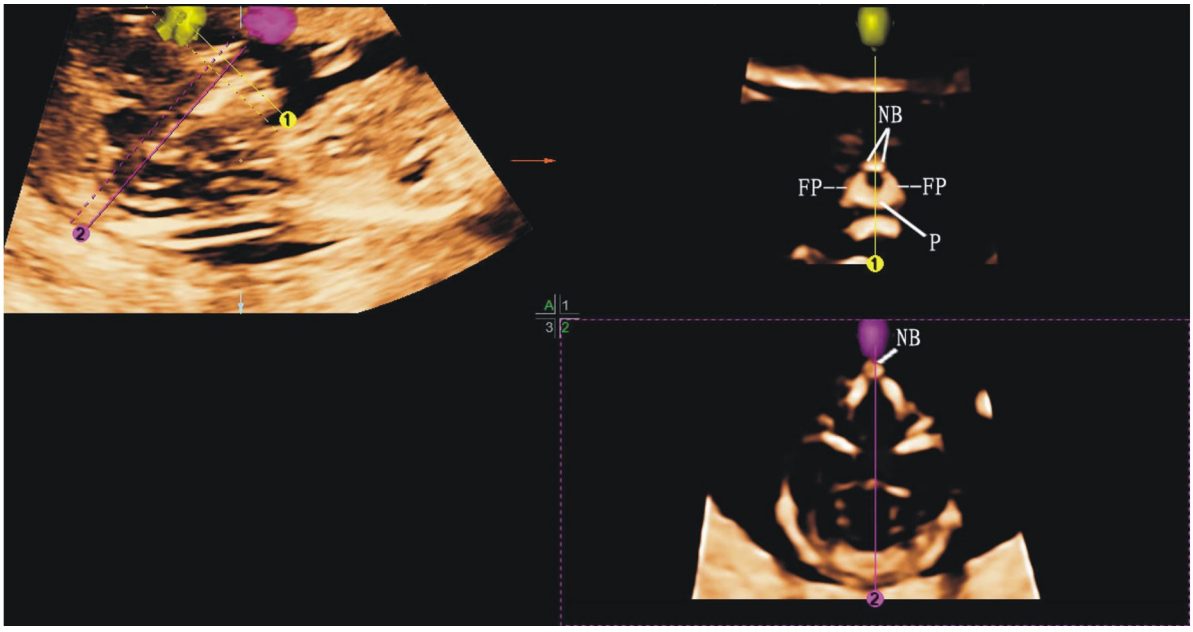


图1　正常胎儿鼻骨的三维超声冠状切面及横切面

注：左上图为参考A平面（颜面正中矢状切面）。第1图（右上图，黄线1）为经上额的鼻后三角冠状面（NB：鼻骨；FP：上颌骨额突；P：颚骨）；第2图（右下图，线2）为沿上腭水平部垂直黄线1的鼻骨横切面（NB：鼻骨）。

1.3　统计学方法　采用SPSS13.0统计软件进行数据分析，计数资料采用χ^2检验，以$P<0.05$为差异有统计学意义。

2　结　果

2.1　二维超声与三维OmniView对早孕期鼻骨的显示率　由表1可知胎儿头臀径于45~84 mm各个

组间，两者对于鼻骨的显示率差异无统计学意义(P>0.05)。三维OmniView对鼻骨的总显示率为97.7%(293/300)稍高于二维超声的95.7% (287/300)，但两者比较差异无统计学意义(P>0.05)。

表1　二维超声与三维OmniView对早孕期鼻骨的显示率[例(%)]

组别	例数	显示率		χ^2值	P值
		二维超声	三维OmniView		
45~54 mm组	65	62(95.4)	64(98.5)	0.0129	>0.05
55~64 mm组	74	73(98.6)	73(98.6)	0.0119	>0.05
65~74 mm组	85	81(95.3)	82(96.5)	0.0111	>0.05
75~84 mm组	76	71(93.4)	74(97.4)	0.0116	>0.05
合计	300	287(95.7)	293(97.7)	0.0069	>0.05

2.2　超声诊断及随访情况　300例胎儿中，其中6例二维超声在颜面正中矢状切面未探及鼻骨，并由于孕妇腹壁脂肪厚、胎动频繁等因素无法获取其他鼻骨切面，但可在胎儿颜面部正中矢状面获取容积数据后，通过三维OmniView描画解剖线，获取鼻后三角冠状切面和其相垂直的横断切面而显示鼻骨(图1)。另外7例二维超声及三维OmniView均未显示胎儿鼻骨(图2和图3)，诊断为鼻骨缺失。其中4例NT测值增厚(1例合并颈部淋巴管水囊瘤和全身皮肤水肿，行染色体检查为21-三体；2例合并颅脑发育异常；1例合并NT测值增厚，随访家属告知染色体异常并于当地引产，出生后证实)；1例(NT：2.4 mm)于12周超声无发现其他异常，于24周在我院Ⅲ级超声检查诊断为叶状全前脑、唇裂合并腭裂、鼻骨缺失、单脐动脉；2例除鼻骨缺失外超声并无发现异常，其中1例染色体检查为46，XN，另一例无异常，小儿出生后除鼻骨扁平并无异常，见表2。

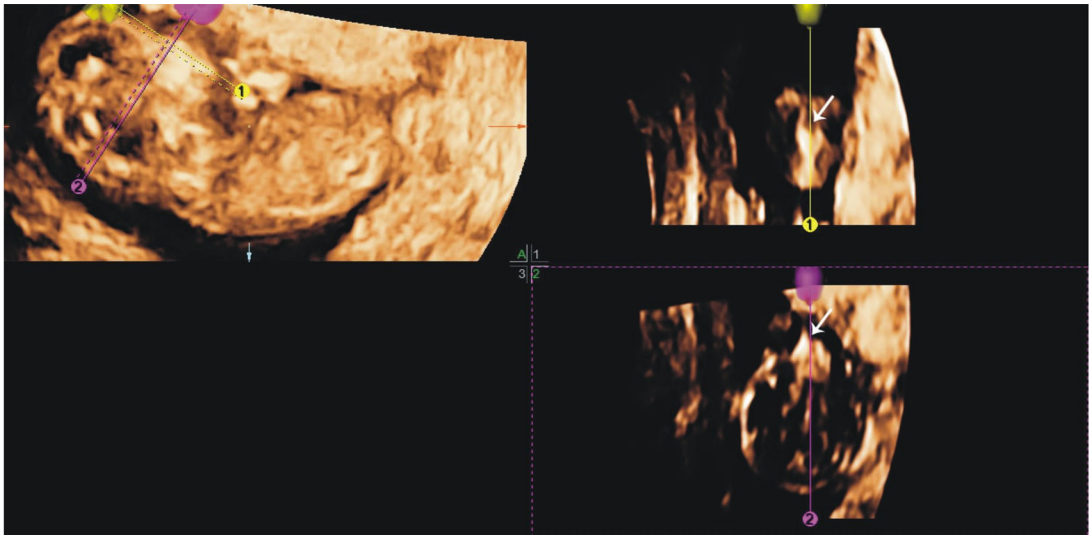
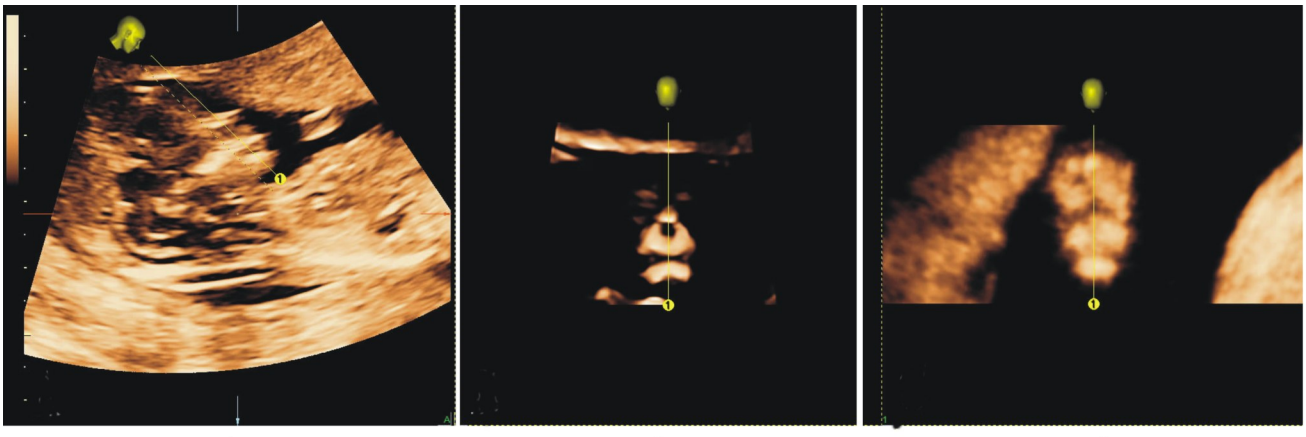


图2　鼻骨缺失胎儿(CRL：59 mm)的三维超声冠状切面及横切面

注：左上图为参考A平面(颜面正中矢状切面)。第1图(右上图，黄线1)为经上额的鼻后三角冠状面(箭头所示为鼻后三角顶点缺失)；第2图(右下图，线2)为沿上腭水平部垂直黄线1的鼻骨横切面(箭头所示鼻骨缺失)。



A　　B　　C

图3　鼻骨缺失胎儿(CRL：57 mm)的三维超声和正常胎儿冠状切面对照：示鼻后三角顶点鼻骨缺失

注：A：正常胎儿的颜面正中矢状切面；B：正常胎儿鼻后三角冠状面；C：鼻骨缺失胎儿的鼻后三角冠状面)

表2　7例妊娠早期鼻骨缺失胎儿产前超声及随访检查结果

序号	孕妇年龄(岁)	CRL (mm)	NT (mm)	胎儿异常	随访
1	26	51	3.0	鼻骨缺失	染色体异常并引产,胎儿鼻扁平
2	31	51	4.0	全前脑,鼻骨缺失	引产后尸解证实
3	36	59	2.8	全前脑,心脏异常(单心室、单组房室瓣),脐膨出,巨膀胱,单脐动脉,鼻骨缺失	选择性终止妊娠,胎儿鼻扁平
4	37	81	8.0	颈部淋巴管水囊瘤,全身皮肤水肿,鼻骨缺失	染色体检查为21-三体,选择性终止妊娠,尸解证实
5	35	55	2.4	鼻骨缺失	24周在我院Ⅲ级检查示:叶状全前脑,唇裂合并腭裂声像,鼻骨缺失,单脐动脉。引产,胎儿鼻扁平,唇裂
6	22	57	2.0	鼻骨缺失	染色体检查为46,XN;array示4q32.1存在2.4Mb重复,31周在我院Ⅲ级检查示:胎儿鼻骨缺失;孕妇顺产下一女婴,重6斤,小孩鼻扁平,生长发育无特殊
7	26	61	1.8	鼻骨缺失	染色体未见异常,25周在我院Ⅲ级检查示:胎儿鼻骨缺失。出生后小孩健康,鼻扁平

3　讨　论

鼻骨由额鼻突演化而来,胚胎4周(月经龄约6周)时形成,直至9周(月经龄约11周)时开始骨化,因此,9周后超声便可以检出鼻骨。由于在孕早期鼻骨较小,要诊断鼻骨缺失传统的二维超声是以胎儿颜面正中矢状切面为最佳观察切面,当不能明确鼻骨是否存在的情况下需加选其他切面为辅助[7-11],但易受胎位及胎动等因素的影响,观察难度较大,并非能对所有的胎儿都能在此切面上清楚显示鼻骨,技术要求高,耗时长。

三维超声OmniView能对容积数据任意方向和角度进行切割,从而获取任意方向和角度的平面,再结合容积对比成像技术(VCI),通过增强二维超声中相似结构和组织对比度,减少图像的斑点噪声,改善分辨力,能更清楚地显示组织边缘和内部结构[12],因此两种技术结合处理图像后可简化对胎儿鼻骨的超声检测,能较快地对胎儿鼻骨缺失做明确的诊断。由本研究可知早孕期三维OmniView对鼻骨的总显示率(97.7%,293/300)比二维超声(95.7%,287/300)更高,但两者并无统计学意义(P>0.05),由此可见其能在二维超声的基础上提供更多鼻骨的诊断信息,并减少对操作者技术和经验的依赖。

此外,妊娠早期鼻骨缺失与多种胎儿异常呈密切相关性,其中胎儿鼻骨联合血清学检查结果是进行唐氏综合征或其他非整倍体畸形风险评估的有效指标[13-15]。因此,妊娠早期明确诊断鼻骨缺失,有利于临床尽早对胎儿预后进行评价,指导临床干预和对孕妇选择妊娠结局具有重要意义。

综上所述,三维超声OmniView(自由解剖成像)操作简便、检查时间短、灵活,能快速且较好地获取鼻后三角冠状切面及其相垂直的鼻骨横断切面,能在二维超声的基础上提供更多鼻骨的诊断信息,减少对操作者技术和经验的依赖,为妊娠早期诊断鼻骨缺失提供了新的思路和方法,是二维超声检查的重要补充,对临床尽早评价胎儿预后及临床干预有重要的指导意义。

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·论 著·

影像学参数对L_4椎体发生退变性滑脱的影响

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【摘要】 **目的** 探讨影像学参数对第4腰椎(L_4)退变性滑脱(DLS))的影响。**方法** 选取我院2012年5月至2014年9月收治的L_4椎体发生DLS的患者56例为DLS组,同期健康体检的志愿者56例为对照组。两组研究对象均行腰椎正侧位X线片、CT及骨密度检查并测量相关影像学参数。采用Logistic逐步回归分析与退变性腰椎滑脱的相关的影像学参数。**结果** DLS组L_4腰椎Ⅰ度滑脱49例,Ⅱ度滑脱7例;滑脱指数为(0.195±0.041)。与对照组比较,DLS组椎间盘高度、L_4椎体大小、椎体指数及骨密度均降低,差异均有统计学意义(P<0.05);而DLS组患者的L_4椎体倾角、腰椎前凸角、骨盆投射角、腰骶角更大,差异均有统计学意义(P<0.05)。与对照组比较,DLS组患者的关节突关节角更偏向矢状位,关节突关节不对称性显著,关节突关节椎弓根角更偏向水平位,差异均有统计学意义(P<0.05)。Logistic逐步回归分析显示椎体指数、L_4椎体大小、L_4椎体倾角、腰椎前凸角、骨盆投射角及关节突关节角是L_4椎体发生退变性滑脱的相关因素。**结论** 低椎体指数、小L_4椎体,较大的L_4椎体倾角、腰椎前凸角、骨盆投射角及关节突关节角增大了L_4椎体发生退变性滑脱的危险。

【关键词】 退变性滑脱;第四腰椎椎体;影像学参数;危险因素

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Effect of radiographic parameters on the 4th lumbar degenerative spondylolisthesis. *WANG Yong-jiang. Department of Spine Surgery, Ordos Central Hospital, Ordos 017000, Inner Mongolia, CHINA*

【**Abstract**】 **Objective** To investigate the impact of radiographic parameters on the 4th lumbar (L_4) degenerative spondylolisthesis (DLS). **Methods** From May 2012 to September 2014, 56 patients with L_4 degenerative spondylolisthesis were enrolled in DLS group, and 56 healthy volunteers were recruited in control group. The participants in both the two groups underwent lumbar lateral X-ray, CT and bone density examination. A series of radiographic parameters were measured on the basis of X-ray and CT results. Logistic regression analysis was used to analyze the risk radiographic parameters of development of DLS. **Results** In DLS group, 49 cases of L_4 spondylolisthesis were classified into grade Ⅰ and 7 cases of L_4 spondylolisthesis were classified into grade Ⅱ, with the average Boxall index of (0.195±0.041). Compared with the control group, disc height, L_4 vertebral size, disc index and vertebral bone mineral density of DLS group were significantly lower (P<0.05), but L_4 vertebra inclination angle, lumbar lordosis, pelvic incidence, lumbosacral angle of the DLS group were significantly larger (P<0.05). Patients in DLS group had more sagittally orientated facet joints, more significant facet joints tropism and more horizontally orientated pedicle-facet angle than the control group (P<0.05). Logistic regression analysis showed that disc index, L_4 vertebral body size, L_4 vertebra tilt, lumbar lordosis, pelvic incidence angle and facet joints were the risk factors of the L_4 spondylolisthesis. **Conclusion** Low disc index, smaller L_4 vertebral size, larger L_4 vertebra inclination angle, lumbar lordosis, pelvic incidence angle and orientated facet joints are the risk factors of the development of L_4 degenerative spondylolisthesis.

【**Key words**】 Degenerative spondylolisthesis; The 4th lumbar; Radiographic parameters; Risk factors

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