

[1]彭秀凡,乔贵宾,曾伟生,等.猪源生物型人工骨进行胸壁重建的可行性及疗效分析[J].第三军医大学学报,2012,34(09):827-831.

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## 猪源生物型人工骨进行胸壁重建的可行性及疗效分析

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Title: Feasibility and therapeutic effect of porcine-derived artificial bone in reconstruction of chest wall in dogs

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**摘要:** 目的 探讨用猪源生物材料骨进行骨性胸壁修复重建的方法及疗效。 方法 对6只中国杂种犬进行右侧开胸, 切除第5~7肋及肋间肌, 胸壁缺损9 cm×8 cm, 用人工骨替移植替代第5、6肋。术后1周及1、3、6、12个月分别行X线照片检查, 观察人工骨有无发生移位、脱落、变形及植入骨溶解变薄。术后6、12个月各解剖2只动物, 分别进行大体检查, 观察人工骨与犬自体骨连接处有无骨痂形成, 对位、对线是否良好, 犬胸壁内外表面弧度与犬胸壁是否一致; 进行组织学检查, 观察植入骨与犬自身骨交界处组织结构及植入骨周围有无排异反应。余下2只进行长期观察, 以预测人工骨长期置入体内的可能性及转归。  
结果 6例动物全部长期存活, X线检查人工骨无移位、脱落、变形及植入骨溶解变薄等。大体观察犬骨性胸壁内外表面塑形良好, 人工骨与犬自体骨连接处有明显的骨组织及软骨组织和明显骨痂形成, 移植骨对位、对线均良好; 组织学观察植入骨与犬自身骨交界处由骨组织和软骨组织组成, 外层为骨膜组织, 有成骨细胞和破骨细胞存在, 未见炎细胞浸润等排异反应, 移植骨中段为纤维结缔组织包绕, 内有新生血管形成。  
结论 猪源生物型人工肋骨是一种优质骨性胸壁重建材料, 置入机体后具有逐渐溶解破坏并向自体骨转化倾向。

**Abstract:** Objective To explore the method and efficacy of chest wall reconstruction by using porcine-derived artificial bone. Methods Through a right extrapleural thoracotomy, a chest-wall defect of 9 cm×8 cm was created by the resection of 5 to 7 ribs and intercostal muscles in 6 Chinese mongrel dogs. Subsequently, neoplasty of chest wall was proceeded using biomaterial. The displaced, curvature, breakage and thickening of the artificial bone was evaluated by X-ray sonography at 5

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postoperative time points (1 week, 1, 3 and 6 months, and 1 year after operation). Gross examination was performed at 6 months and 1 year after operation to observe the callus formation, ossification, osteolysis, moulding of rib cage and surface shaping of the skeleton of thorax to evaluate the biological property of implanted biomaterials. Histological examination was also performed at the same time to observe the construction of the junction and the surrounding tissue of the artificial bone and integrity of the skeleton of thorax. The last 2 animals were used to anticipate the ability of long lasting implanted ribs and the relationship between artificial ribs and post-treatment outcomes.

**Results** All animals in our study survived through all the experiment and it had satisfactory efficacy. No displacement, curvature, breakage and thickening of the artificial bone was found by X-ray during the follow-up period. Gross observation showed osteotylus had come into been between the rib junctions and materials, and the remoulding of skeleton of thorax was also observed. Through histological observation, cartilaginous tissue and ossification at the rib junction was observed. In ossification process, osteoblasts, osteoclasts and periosteum were observed, fibrous connective tissue was observed around the artificial rib, and no inflammation cell infiltration was detected.

**Conclusion** Biomaterial is a satisfactory prothesis in application of chest reconstruction. It can be used for its good plasticity, and then turn to autologous tissue.

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