Effects of different lengthening rates on the periosteum and the patterns of bony repair in the lengthened zone of rabbit tibias

Gao Zhigang, Li Qihong, Mao Shuyan (Department of Orthopedics, Southwest Hospital, Third Military Medical College, Chongqing, 630038)

Abstract The tibia was lengthened with proximal metaphyseal osteotomy in 30 rabbits. It was observed on x-ray films and histological slides that the lengthening rates of 1 mm/day, 2 mm/day, and 3 mm/day exerted different effects on the periosteum and the patterns of bony repair in the lengthened zone. The periosteum remained intact with active intramembranous and endochondral ossifications when the lengthening rate was 1 mm/day. Too rapid lengthening would bring about harmful effects. It is believed that the low tension resulting from a low lengthening rate can stimulate the periosteum to proceed on normal ossification without adverse injuries.

Key words lengthening rate; periosteum; tibia

论文摘要

烧冲复合伤肺脏病变及其发病机理的实验研究

郑怀恩 程天民* （第三军医大学卫生防疫系防原医学教研室）630038

烧冲复合伤是核爆炸所致的主要伤类之一，在常规战争和平时多类爆炸事故中也经常发生。本文以单一伤与复合伤相对照，不同致伤顺序相对比，形态定性与多项图象分析测量相结合，宏观、光镜、电镜形态观察与功能相联系，着重研究烧伤、冲击伤和两伤合并后的肺脏病变特点，更侧重于肺血管的病变。共用大鼠 610 只，进行了多批次实验研究。

用 BST-Ⅰ型生物激波管，以超压作用为主致伤 388 只大鼠，实际造成的冲击伤伤情差异较大，除速发死亡者外，活存下来的多数为中度偏重伤情。119 只于 1 h 内速发死亡，死亡率为 29.5%。对这些死亡动物虽无医疗救治意义，但可研究冲击波原发效应。研究表明，15min 以内死亡者，主要死于严重肺出血，平均出血体积占全肺的 90%以上；稍后速发死亡者，则主要死于严重肺水肿合并肺出血，即肺出血是比肺水肿更早的主要死因。肺出血除毛细血管破损外，主要是 20μm 以下的微静脉广泛破裂的结果，其发生机理主要是冲击瞬间的压力差效应。

15% Ⅱ度光辐射烧伤，肺脏病变较轻，大多属超微结构层次的变化，中性粒细胞在肺毛细胞血管内积聚对肺损伤可能起重要作用。冲击伤动物发生了累及肺泡上皮、间质和血管的广泛病变，但在没有并发感染等情况下，出血吸收较快，预后恢复良好。

两伤合并后的复合效应，因致伤顺序不同而有异。先烧后冲动物出现明显加重效应，与单伤比较，超微结构病变更重，肺血管通透性更显，肺出血水肿加重、吸收减慢，24 h 内有续发性出血。肺部感染发生更早、更重，主要为肺源性感染，有间质性、肺泡性肺炎和肺脓肿外，小动脉周围炎也更多见。将烧伤动物血

（下转 581 页）

* 导师

© 1994-2014 China Academic Journal Electronic Publishing House. All rights reserved. http://www.cnki.net

Detection of diaphragmatic fatigue with electromyography in patients with chronic obstructive emphysema

Mo Jingde, Wang Changzheng, Guo Xianjian, et al (Department of Respiratory Diseases, Xinqiao Hospital, Third Military Medical College, Chongqing, 630037)

Abstract The fatigue of the diaphragm was determined with electromyography in 35 patients with chronic obstructive emphysema (COPD) and in 47 nomal subjects serving as the control. It was found that the high/low frequency ratio (H/L) and the central frequency (Fc) of the diaphragmatic electromyogram (EMGdi) were markedly decreased after diaphragmatic fatigue in COPD patients as well as in the controls ($P<0.05$). When a 15% decrease of H/L was defined as a criterion of diaphragmatic fatigue, the detection rate of diaphragmatic fatigue was 60% in COPD patients and 76.6% in the controls. There was no significant difference of H/L and Fc before and after diaphragmatic faigue between COPD patients and the controls, which indicates that EMGdi is not able to reveal the minute functional difference of the diaphragm of the 2 groups. When a 5% decrease of Fc was defined as a criterion of diaphragmatic fatigue, the detection rate of diaphragmatic fatigue was 51.4% in COPD patients and 61.7% in the controls. The detection rate of H/L and Fc were similar. It is concluded that EMGdi is a simple and reliable method to detect diaphragmatic fatigue.

Key word electromyography; diaphragm; gatigue; lung diseases, obstructive

（上接 570 页）

清注入冲击伤动物后，其肺血管通透性较单冲增加更显，出血吸收减慢，小动脉周围炎明显，说明烧伤后可能产生了加重伤情的物质因素。而烧后约 1 h 复合冲击伤的动物，却出现减轻效应，表现为速发死亡明显减少，肺出血减轻，肺毛细血管和肺泡上皮病变较轻，未发生严重感染。这种减轻效应的机理可能主要是烧伤早期休克减轻了冲击波的血液动力学效应，此外肺毛细血管内粒细胞积聚对压力波传播也会起缓冲作用。

冲烧复合伤和冲击伤大鼠肺微血管病变十分突出，累及小动脉、毛细血管和小静脉。微血管病变构成了肺出血、水肿的病理基础，而出血、水肿是肺脏的主要病变，常决定整体伤情的轻重和转归的好坏。肺泡上皮虽也可严重受损，但修复能力较强，而微血管，特别是内皮细胞的病变，损伤重，恢复慢，影响较大。

关键词 烧冲复合伤；肺/病理学；灼伤/病理学；爆炸伤/病理学

© 1994-2014 China Academic Journal Electronic Publishing House. All rights reserved. http://www.cnki.net