

99mTc - MDP 显像判断高压电损伤程度

许晓光, 李伟萍, 李华强, 刘天一, 何广仁, 黄铁军

【摘要】 目的: 研究应用 ^{99m}Tc -MDP ECT 显像技术诊断试验高压电损伤的损伤程度。方法: 15 只兔, 用高压电造成轻、重和毁损三种损伤模型, 伤肢分别进行 ^{99m}Tc -MDP 三相显像、解剖探索和组织学观察。结果: 轻度击伤肢血流相及血池相均显示局部核素浓聚, 组织学上证实为细胞轻度水肿, 微血管栓塞, 重度损伤, 肢体远端影象淡而不清, 并在近端影象骤然增强, 组织学上为肌间隔性溶解碎裂, 多数血管栓塞, 特重毁损伤肢动脉学流灌注中断, 影象的界面平整刀割样, 镜下肌大片溶解坏死。结论: 组织损伤程度与 ^{99m}Tc -MDP 影浓淡缺失一致, 与组织学和临床相符, 可较准确反应不同损伤的伤情。

【关键词】 ^{99m}Tc -MDP; 电损伤; 诊断

【中图分类号】R647 **【文献标识码】**A **【文章编号】**1001-0726(2001)03-0156-03

99m TcMDP Visualization for Determination of the Degree of High Voltage Electric Injury Xu Xiao-guang, Li Wei-ping, Li Hua-qiang, et al. Dept. of Burns and plastic Surgery, Red Cross Hospital, Shenzhen 518035

【Abstract】 Objective: Try to use ^{99m}Tc -MDP ECT visualization technique for the determination of the degree of high voltage electric injury. **Method:** 15 rabbits were injured electrically to result in slight, severe and destructive electrical injuries in limbs. Three-phase visualization was done in injured limbs using ^{99m}Tc -MDP and anatomical and histological changes were observed. **Results:** In limbs with slight electric injury, local concentration of nuclide was found in blood stream and pool phases. The cells had slight edema and micro-vessels were blocked. In limbs with severe injury, distal pictures were weak and not clear and proximal pictures were strengthened. Histologically, there were dissolved fragments of intermuscular spetum and most of the vessels were blocked. In limbs with especially severe injury, blood flow and perfusion was blocked in artery, the interface of the picture was flat as knife cut. Muscles were necrotic and dissolved when observed under microscope. **Conclusion:** Histological injury degree agrees with the degree of the clearness of the picture of ^{99m}Tc -MDP and also agrees with the clinical data. ^{99m}Tc -MDP visualization method can reflect the degree of the injury.

【Key words】 ^{99m}Tc -MDP; Electric injury; Diagnosis

【CLC number】R647 **【Document code】**A **【Article ID】**1001-0726(2001)03-0156-03

高压电损伤的诊断是一个大难题^[2,6]。通常依靠临床征象判断伤情, 亚甲蓝染色, 组织活检及多普勒超声检查等方法为辅助应用, 但都难以做出确切的诊断。本文使用自行建立的系列动物模型, 选用 ^{99m}Tc -MDP 三组动态肢体核素显像技术、组织学及解剖探索, 比较研究核素显像技术来评估高压电非热损伤的程度, 结果令人满意, 报道如下。

材料和方法

一、电损伤动物模型: 以新西兰兔作实验动物, 在一侧后肢踝上 20mm 处置小极板, 大腿后外侧平尾骨水平置大极板, 电压 1680 伏, 平均场强 $17000\text{V}/\text{m}^2$, 平均电流强度 554mA, 平均电流密度: 小极板下是 $137\text{mA}/\text{cm}^2$, 大极板下是 $21\text{mA}/\text{cm}^2$

2M, 组织温度平均升高 1.75°C 。通电后造成一个没有肉眼可见皮肤坏死的损伤区, 从小极板中心到大极板中心将损伤区分为 A、B、C、D、和 E 五区, 各项指标均按此分区标准分析判定。

二、动物分组: 新西兰兔 15 只, 随机分为 3 组, 包括轻、重、毁损三种不同电损程度模型。伤后 2 小时、5 天、10 天分别进行核素显像、组织学检查和活体解剖探索。对侧肢体供对照, 并侧重分析三种类型电损伤的实验结果。

三、动态核素显像: ADACPEGASYSSPECT 配一低能通用型准直器。 ^{99m}Tc -MDP(亚锡亚甲基二磷酸盐)由广州希埃公司提供, 按每千克体重 $0.55\text{MBq}(15\mu\text{Ci})$ 计算, 自耳缘静脉快速注入, 同步启动 SPECT 进行动态采集, 先每 2 秒采集 1 帧, 连续采集 60 帧, 列为肢体动脉灌注相; 紧接每 5 秒采