NON-THERMAL BURN INJURY Electrical injuries

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Electrical injuries are usually divided into low- and high-volt age injuries, the threshold being 1000 /uni00A0 V . Summary box 46.19 Electrical burns /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF /uni25CF Low-tension injuries Low-tension or domestic appliance injuries do not have enough energy to cause destruction to significant amounts of subcutaneous tissues when the current passes through the body . The resistance is too great. The contact point, normally in the fingers, su ff ers small deep burns; these may cause under lying tendon and nerve damage, but there will be little damage between. The alternating current creates a tetany within the uscles, and thus patients often describe how they were unable m to release the device until the power was turned o ff . The main danger with these injuries is from the alternating current interfering with normal cardiac pacing. This can cause cardiac arrest. The electricity itself does not usually cause significant underlying myocardial damage, so resuscitation, if successful, should be lasting. High-tension injuries High-tension electrical injuries (Figure 46.12) can be caused by one of three sources of damage: the flash, the flame and the current itself. When a high-tension line is earthed, enormous energy is released as the current travels from the line to the earth. As the current travels through the air, the air is heated and expands hich can propel the victim. A flash in an explosive manner, w burn is the contact of superheated air with the skin for a short duration. The flash, however, can go on to ignite the patient’s clothes and so cause a normal flame burn. - In accidents with overhead lines, the patient often acts as the conduction rod to earth. In these injuries, there is enough current to cause damage to the subcutaneous tissues and mus - cles. The entry and exit points are damaged but, importantly , the current can cause huge amounts of subcutaneous dam - - age between these two points. These can be extremely serious injuries. in the a ff ected limb The damage to the underlying muscles can cause the rapid onset of compartment syndrome requiring lobin will cause urgent fasciotomies. The release of the myog herefore, myoglobinuria and subsequent renal dysfunction. T during the resuscitation of these patients, e ff orts must be made to maintain a high urine output of up to 2 /uni00A0 mL/kg body weight per hour. Severe acidosis is common in large electrical burns and may require fluid and bicarbonate boluses. These patients are also at risk of myocardial damage as a result of direct mus - cle damage, rather than by interference with cardiac pacing. This gives rise to significant electrocardiogram changes, with raised cardiac enzymes. If there is significant damage, there vere injury is rapid onset of heart failure. In the case of a se through a limb, primary amputation is sometimes the most e ff ective management.

Low-voltage injuries cause small, localised, deep burns They can cause cardiac arrest through pacing interruption without signi /f_i cant direct myocardial damage High-voltage injuries damage by /f_l ash (external burn) and conduction (internal burn) Myocardium may be directly damaged without pacing interruption Limbs may need fasciotomies or amputation Look for and treat acidosis and myoglobinuria (c) Figure 46.12 (a, b) High-voltage electrical injury resulting in ampu

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