

III.9 Surgical Treatment of Mustard Gas Induced Skin Lesions in Guinea Pigs

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Male guinea pigs with a body weight (BW) of 280–450 g were exposed to mustard gas (MG) vapor through a shaved skin area of 5 cm² under general anesthesia. After exposure, the animals were allocated to either conservative treatment (controls) or surgical excision of the skin lesion six hours after exposure followed by primary closure or skin autografting. Animals were followed for four to six weeks, and skin lesion healing time as well as BW increase (as index of general condition) were observed.

Mustard gas doses of 1×10^4 – 3×10^4 mg x min/m³ gave rise to visible skin erythema within six hours. No macroblistering occurred. The dose 2×10^4 mg x min/m³ was chosen as standard dose in most experiments.

Healing time in the control group was 22 ± 2 days (mean \pm SEM) and in surgical group 15 ± 1 days ($p < 0.01$, Wilcoxon Rank Sum Test) and increase in BW 44 ± 10 % (mean \pm SEM) and 50 ± 12 % respectively ($p < 0.01$).

Surgical treatment of MG induced skin lesions in guinea pigs significantly decreased healing time and improved general condition compared to the conservative treatment.

III.10 Nuclear Disasters: Diagnosis And Treatment

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Exposure of persons to ionizing radiation can take place by external irradiation (partial or total body), or through external or internal contamination with radionuclides. Combination of these modalities of exposure to ionizing radiation, as well as combined lesions (thermal, mechanical, and chemical), also is possible.

The first diagnostic question after cessation of exposure will be whether someone is exposed, and to what extent. A difference has to be made for the three aforementioned modalities of exposure. In cases of external irradiation, it is important to have an estimation of the dose received. This estimation can be based on the physical dosimetry in the environment of the accident, and clinical dosimetry in the patient. As measurements are not always very exact during the accident or shortly after release of a radioactive cloud, calculations have to be made to establish the possible dose. Clinical dosimetry is based on the symptoms of people who have been exposed. It is important to know the presence of symptoms, the severity of the symptoms, and the time between the exposure and the development of symptoms. Biological dosimetry is based primarily on the total count of lymphocytes in peripheral blood. The dip in the number of these lymphocytes within the first 24 hours after exposure gives the best impression concerning the acute dose. In cases of contamination, external contamination has to be ruled out first. After external decontamination, internal contamina-

tion has to be evaluated by analysis of blood and urine, and by means of external counting techniques, such as with a total body counter. Intensive treatment is necessary in case of the acute radiation syndrome. This treatment is aimed at the prevention and treatment of infections, transfusion of deficient blood cells, and administration of hematopoietic growth factors. The results of acute bone marrow transplants, which were performed after the Chernobyl accident, are disappointing, and bone marrow transplantation is no longer considered a valid treatment option. Treatment of internal contamination is directed at the prevention of absorption and enhancement of elimination. The treatment methods used are the same as those used in medical toxicology.

III.11 Experience from Management of a Patient with Hemorrhagic Fever

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In 1990, a patient with viral hemorrhagic fever (VHF) was treated at the intensive-care unit (ICU) and Department of Infectious Diseases, University Hospital in Linköping. This is the first patient ever treated in Scandinavia for a disease caused by VHF capable of person-to-person transmission. Viral hemorrhagic fever has a mortality rate of 25–80%. Despite three needle-stick accidents, we had no secondary cases. The patient was critically ill with a fever above 40°C (104°F) for three weeks, severe bleeding, septicaemia, respiratory failure, and disseminated intravascular coagulation (DIC). He had to be transfused with 65 units of packed red blood cells. He was treated by personnel using maximal-barrier nursing procedures, including disposable gowns, gloves, and shoe-cover precautions, and a flexible hood with a battery driven HEPA-filtered air blower.

It is recommended that a patient with suspected VHF should be treated at the hospital of admittance. A high-security containment regimen should be arranged as soon as possible in the ward, ICU, and laboratories. A national, mobile unit consisting of highly trained personnel from the Department of Infectious Diseases, Linköping and Swedish Institute for Infectious Disease Control, Stockholm, is available for advisory support on request. Protective equipment for complete barrier nursing can be brought. Patients also could be treated in Linköping at a specially designed, completely separated isolation unit. This is characterized by separate ventilation with virus-safe filters, low air pressure in the patient's room, admission through anterooms, intensive-care facilities, decontamination facilities in the patient sanitation room, and a laboratory within the unit.