Q4

A factory worker presents to your department with 3% body surface area burns to his hands & forearms from a 100% hydrofluoric acid solution.

1. What percentage of body surface area burns would be expected to be associated with systemic toxicity from this acid and how does it cause toxicity? (3 marks)
2.5% BSA
Fluoride ions bind to calcium's & magnesium resulting in cell dysfunction and death.
Systemic toxicity and ventricular dysrhythmias occur secondary to hypocalcaemia, hypomagnesaemia and acidosis.

2. List 3 investigations that may be useful to help determine further management of this patient and describe the abnormality that may be detected.(3Marks)
ECG : low Ca -> QT prolongation
Serum/ionized Ca – at presentation & Q4 hrly – likely to be low Ca.
Serum Mg – may also be low.
VBG – to detect acidosis
BSL – low/high may be an alternative cause for altered LOC

3. Name the antidote used to treat hydrofluoric acid toxicity. (1 mark)
Calcium.

4. List 3 routes by which it may be administered & the dose typically used for each route. 3 marks.
-Topically to the skin as a gluconate gel (2.5%) -this can be applied immediately to the skin after exposure until pain resolves.

-Intradermally – difficult in the fingers to give adequate volume.
Usual dose = 0.5ml/cm^2 of Ca Gluconate (avoid Ca CO_3)

- Regional IV infusion -eg. with Biers Block- Dilute 1g of Ca Gluconate in 40mls of N saline, infuse into the arm and leave the cuff inflated for 20 minutes.

- Intra-arterial infusion - dilute 1 ampoule of Ca gluconate in 40 ml normal saline & infuse over 4 hrs. Can be repeated as necessary.