Protocol for Intra-arterial Calcium Infusion for Hydrofluoric Acid Burns

1) Minimum baseline laboratory includes calcium, magnesium, phosphorus, prothrombin time (PT), and partial thromboplastin time (PTT).

2) The appropriate artery is cannulated with a 20-gauge, 4 French or 5 French arterial catheter.

3) Insertion of the catheter proximally several centimeters into the radial artery for burns to the thumb, index, or middle fingers. Or alternatively, the catheter is advanced proximally into the brachial artery allowing access to the ulnar circulation for burns involving the ring and small finger.

4) Admit patient to ICU for arterial pressure wave monitoring. Great care must be exercised to ensure that the catheter is appropriately placed intravascularly (by continuous wave form analysis) as tissue necrosis and digit loss have occurred following extravasation of calcium salts. Continuous EKG monitoring is essential.

5) Infuse solution of 10 mL of 10% calcium chloride diluted with 40 mL of normal saline over a 4 hour period.

6) The arterial wave form is checked every hour and the arterial line is flushed with heparinized saline.

7) After infusion of the calcium chloride mixture, the infusion tubing is flushed with another 10 mL of normal saline over a 15-minute period.

8) With the addition of 500 units of heparin to the infusion mixture, catheter clotting has been significantly reduced.

9) Catheter clots (manifested by a flattened waveform or difficulty withdrawing blood from the catheter) are lysed with a thrombolytic agent.

10) After infusion is complete, the waveform is monitored continuously and the line flushed with heparinized saline every hour and as needed.

11) If pain from the HFI Burn returns within a 4-hour observation period, the infusion cycle is repeated as necessary until the patient remains symptom free. The process of 4 hours of infusion followed by 4 hours of rest is repeated until there is no residual pain or tenderness to gentle pressure.

12) After tenderness has resolved, the catheter is removed and the patient is transferred to the surgical floor for an observation period of 16 to 24 hours before being discharged.

13) Serum calcium, magnesium, phosphorus, PT, and PTT are obtained 1 hour after completion of the infusion. If the serum magnesium falls by 0.3 mg/dL or falls below 1.7 mg/dL, an IV infusion of magnesium sulfate is begun using 1.015 mEq/hour to 4.06 mEq/hour, adjusting the rate according to the subsequent serum magnesium levels and number of calcium infusions being delivered.

References:
