

## METALLOSIS AND INTRAOPERATIVE CELL SALVAGE

### AREA of APPLICATION

Metallosis is a medical condition involving the accumulation and deposition of metal debris in the soft tissues of the body.

The risk of using intraoperative cell salvage (ICS) with metallosis in situ should be carefully considered, by the clinical team, on an individual case basis and balanced against the benefits of using ICS.

### STAFF

All staff involved in the cell salvage process, the surgeon, anaesthetist and the theatre practitioner for the procedure.

### BACKGROUND:

**Metallosis** most commonly occurs when metal implants grind on each other causing fragments to shed. It is associated in particular with hip resurfacing or replacements with a 'metal on metal' bearing, but can also be seen with any worn or damaged joint replacement where metal parts have come into contact with each other.



Metallosis is estimated to occur in around 5-10% of 'metal on metal' joint implants and hip resurfacing. Typically the metals involved are cobalt, chromium and titanium. Particles of metal and soluble metal ions are released. The immune system identifies the debris as foreign bodies, which can lead to adverse inflammatory reactions including fluid collections, tissue necrosis and occasionally a rash (Adverse Reaction to Metal Debris – ARMDS).

Symptoms include pain, swelling and implant loosening secondary to the necrosis.

The fragments can also be absorbed and lead to metal poisoning and multi-organ failure. There may also be an “embolic” component from the metal clumps.

All surgical teams and cell salvage operators need to be aware of this condition and should be vigilant. Caution needs to be applied during implant revision cases, particularly of ‘metal-on-metal’ joints, where cell salvage may run the risk of being contaminated with metal debris.

There is very little evidence of how effective IOCS is at removing the metal fragments, a paper from Belgium in 2009 reported >70% removal of the metal but still advised caution. Some companies are starting to manufacture a filter, designed to catch the metal debris, with a much smaller pore size than the usual filter; but, as yet there is no evidence to confirm its effectiveness.



If there is evidence of metallosis, in most situations, cell salvage should be avoided. The risk benefit balance should be carefully assessed in cases of high blood loss. Few cases have been reported to the UKCSAG, in one case the blood was discarded before reinfusion could be commenced and in 2 cases small metal fragments were found in the bottom of the blood transfusion bag and in the filter at the end of the infusion. Neither of these patients came to any harm as evidenced in rigorous follow up.

**All suspected cases of cell salvage contamination should be reported to SHOT.**

## **REFERENCES**

Reijngoud LW, Pattyn C, De Haan R, De Somer F, Campbell PA, Gill HS, De Smet KA. (2009) Does intraoperative cell salvage remove cobalt and chromium from reinfused blood? *Journal of Arthroplasty*. Oct; 24(7):1125-9

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