

One-Stage Revision Total Knee Arthroplasty using Methylene Blue-Guided Debridement

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Background:

Periprosthetic joint infection (PJI) remains a common cause of failure, revision surgery and mortality for patients with total knee arthroplasty (TKA). Two-stage revision arthroplasty with a first-stage debridement and explantation with placement of a temporary spacer, followed by a staged re-implantation of revision components has been the gold standard for treatment of PJI. More recently, one-stage revision has gained popularity, especially in Europe, where explantation and debridement occur during the same surgery as reimplantation. But in order to facilitate a safe one-stage procedure, the surgical debridement needs to be radical and complete in order to prevent failure. Recent studies have demonstrated that in the right patient, one-stage surgery, when performed effectively can be equally as effective at infection eradication while lowering healthcare costs and being less morbid than two-stage revisions.

Purpose:

This video demonstrates a case of chronic knee PJI treated with a one-stage revision while using methylene blue dye to guide and facilitate a thorough debridement.

Methods:

The treatment options for chronic PJI of the knee are reviewed, and methylene blue as an augment to surgical debridement is introduced. A case of a 75-year-old male with a history of chronic PJI of the knee is presented. The patient's workup was notable for scalloping osteolysis concerning for chronic infection and lab values consistent with PJI, including polymerase chain reaction (PCR) results that were positive for streptococcus species. After a thorough discussion of risks, benefits and prognosis, the patient elected to proceed with one-stage revision knee arthroplasty to improve his functional status.

Results:

Methylene blue was injected into the knee capsule prior to making the arthrotomy. After opening the knee, the blue cationic dye stained all tissues that were in need of debridement and a thorough, extensive debridement of all stained tissues were performed including synovium, cement, fibrous tissue and bone. Following debridement, the surgeons proceeded to perform a one-stage revision knee arthroplasty using revision components. Post-operatively the patient improved in terms of pain and function and successfully cleared his PJI without signs of recurrence at most recent follow-up.

Conclusion:

Methylene blue can be a useful augment to one-stage revision knee arthroplasty, as it can act as a visual guide to assist the surgeon in performing a thorough and extensive surgical debridement prior to re-implantation of new components. Methylene blue may also have antibacterial properties although this needs to be the subject of further study.