Short Report

Migration of Gentamicin Beads into Duodenum following Treatment of Primary Infection of the Aorta

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A B S T R A C T

Introduction: Gentamicin impregnated beads have been used in the treatment and prevention of infections in vascular surgery. Report: A patient presented with sepsis 6 years after repair of an infrarenal aortic mycotic aneurysm with an in situ polytetrafluoroethylene (PTFE) graft and implanted gentamicin beads. Several beads migrated into the duodenum resulting in a paraprosthetic sinus. The patient was successfully treated with duodenal resection and Roux-en-Y anastomosis.

Discussion: This report highlights a serious complication relating to the implantation of gentamicin beads in the retroperitoneum. We would advocate aggressive debridement and coverage of the infected field with well-vascularised tissue rather than permanent gentamicin bead implantation.

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Introduction

In vascular surgery gentamicin beads have been used in the setting of established graft infection, wound infection and for prophylaxis in high-risk sites.1 The beads consist of polymethylmethacrylate (PMMA) beads threaded on multi-stranded surgical wire and impregnated with 4.5 mg of gentamicin (Septopal®, Biomet, Warsaw, USA). They provide a high local concentration of gentamicin while avoiding systemic side effects as the serum concentration remains below the toxic level. This case report illustrates a previously unreported complication associated with permanent implantation of gentamicin beads in the retroperitoneum.

Case Report

A 56-year-old female presented with fevers, lethargy and weight loss. She had a past history of type 2 diabetes, hypertension, total hysterectomy and primary infection of the juxta-renal aorta. The aortic infection occurred 6 years prior and was treated with an in situ aortic reconstruction (polytetrafluoroethylene (PTFE) tube graft) and empirically implanted gentamicin beads. 10 months prior to the current presentation she developed severe sepsis secondary to an infected spontaneous left thigh haematoma, which was treated with surgical drainage and 6 weeks of broad-spectrum antibiotics. The infected haematoma cultured gram-negative bacilli, gram-positive cocci and mixed anaerobes, and blood cultures grew Escherichia coli and micro-aerophilic streptococcus. A technetium-99m labelled white cell scan performed at this time failed to demonstrate any evidence of graft infection.

She represented with fevers and blood cultures grew vancomycin-resistant Enterococcus faecium (VRE). On examination there was evidence of significant weight loss, the right popliteal pulse was absent and there was bilateral clubbing of her toes. A vascular surgery consult was sought and it was felt that the possibility of underlying graft infection/graft-enteric erosion warranted further investigation. A gastroscopy revealed 2 gentamicin beads in the lumen of the third part of the duodenum (Fig. 1). CT angiography demonstrated beads within the duodenum, eccentric mural thrombus within the lumen of the PTFE graft and an embolic occlusion of the right popliteal artery (Fig. 2).

The patient underwent exploratory laparotomy and the string of gentamicin beads was found to have eroded into the third part of the duodenum with an adjacent paraprosthetic sinus involving the body of the PTFE graft. A duodenotomy was made and 2 gentamicin beads were removed from the third part of the duodenum. The third part of the duodenum was resected and a Roux-en-Y anastomosis performed. The body of the PTFE graft was bile stained, but the proximal and distal anastomoses were well incorporated. Given the known close proximity of the proximal anastomosis to the renal...
artery origins it was felt that it would not be possible to explant the graft and oversew the aortic stump without compromising the arterial supply to both kidneys, therefore the graft was left in situ and covered with an omental flap. An aortic and popliteal embolectomy was performed with a Fogarty embolectomy catheter via the right common femoral artery. The aortic and popliteal thrombus was separately sent for culture and both specimens grew VRE, Candida albicans and Candida glabrata. The gentamicin beads removed from the duodenum also cultured VRE, Candida albicans and Candida glabrata. She was treated with meropenem, linezolid and caspofungin on the advice of the infectious disease physicians. She was discharged home after 3 weeks on oral linezolid and ciprofloxacin with a plan for life-long antibiotic therapy. Her inflammatory markers have normalised and she has no evidence of recurrent infection after 10 months of follow up.

Discussion

This case demonstrates a previously unreported complication of permanent gentamicin bead implantation. The erosion of the beads into the duodenum led to a paraprostatic sinus, graft contamination with duodenal contents and bacteraemia. Septic emboli from the infected mural thrombus within the aortic graft are likely to have resulted in embolic occlusion of the right popliteal artery and an infected spontaneous thigh haematoma.

Gentamicin beads have predominantly been used in the prevention and treatment of orthopaedic infections, although a number of randomised trials have failed to demonstrate any benefit. Permanently implanted beads may be themselves become colonised with pathogens and may lead to the emergence of resistant organisms.

Gentamicin beads have also been used in vascular surgery, head and neck surgery, diabetic foot infections and with ventricular assist devices. In the setting of vascular graft infection cure rates of 50–85% have been reported. Complications have been described in vascular patients who had the beads permanently implanted, including patient discomfort, interference with wound healing and kinking of a femoropopliteal bypass graft resulting in graft occlusion. Reilly et al. described a novel technique for temporarily implanting gentamicin beads into the retroperitoneum after aortic graft infection treated with explantation and extra-anatomic bypass. The beads were placed in a silastic drain with several side holes cut, which kept the beads separated from the bowel and allowed easy removal after 7 days. Infection was eradicated in all 6 patients treated with this technique.

While local delivery of antibiotic therapy in addition to surgical debridement and systemic antibiotics for vascular graft infection is an attractive concept, evidence supporting this is limited. We would advocate aggressive debridement of the infected tissue and coverage with well-vascularised muscular or omental flaps in preference to gentamicin bead implantation. If local antibiotic therapy is desired a biodegradable delivery system would seem
preferable, however insufficient evidence exists to recommend this as routine practice.

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None.

**References**


