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## Acute renal failure due to tobramycin intoxication during selective digestive tract decontamination

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Dear Editor,

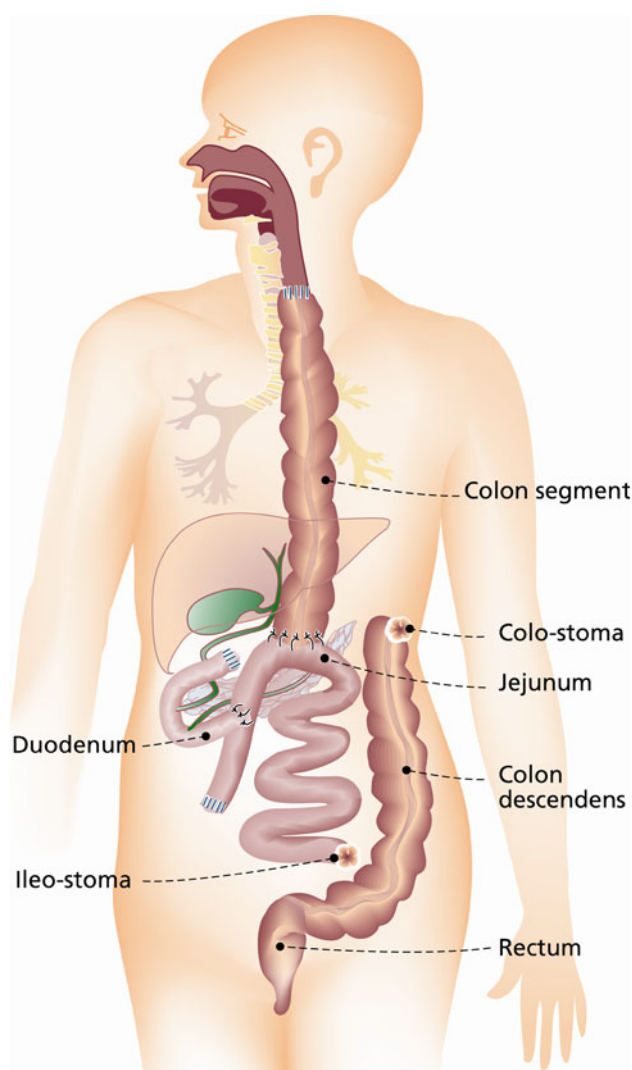
A 52-year-old man was admitted to the intensive care unit (ICU) with septic shock due to pneumonia. Two months before he had an oesophago-gastrectomy because of carcinoma of the distal part of the oesophagus. The post-operative course was complicated because of ischaemic lesions in the transverse colon and suture dehiscence of the ileotransversostomy. An ileostomy and colostomy were constructed (Fig. 1).

Apart from antibiotic treatment, he received selective decontamination of the digestive tract (SDD) as described previously by De Smet et al [1]. SDD was administered four times daily as a 2% oral paste, containing amphotericin B, tobramycin and colistin. Four times daily a 10 ml (containing 500 mg amphotericin B, 100 mg colistin, 80 mg tobramycin) suspension was given nasogastrically. Additionally, twice daily a suppository (containing 500 mg amphotericin B, 40 mg tobramycin, 100 mg colistin) was administered in the colostomy of the descending colon. He recovered but because of ICU-acquired weakness he needed prolonged mechanical ventilation. Thirty days after admission he became oliguric and developed renal

failure with renal acidosis without further clinical signs of haemodynamic instability. His creatinine level gradually increased from 50 to 263  $\mu\text{mol/l}$ . Physical, laboratory and radiological examination ruled out sepsis, hypovolaemia and post-renal obstruction. Medication-induced nephrotoxicity was suspected. Serum tobramycin level was elevated (18.9 mg/l). SDD was discontinued.

After haemodialysis and veno-venous haemofiltration tobramycin levels became undetectable again. However, renal insufficiency persisted and he remained dependent on dialysis.

Elevated serum tobramycin levels during SDD have been shown in patients with normal renal function and pre-existent renal insufficiency [2, 3]. Several mechanisms might explain increased serum levels of



**Fig. 1** Schematic drawing of patient's changed anatomy after surgery. Resection of esophagus and stomach, replaced by a colon segment with a Roux-Y reconstruction. After suture dehiscence of the ileotransversostomy the suture was opened, transversotomy was performed because of multiple ischaemic lesions. An ileostomy and colostomy were constructed

non-absorbable antimicrobial agents in this patient. First, the integrity of the mucosal barrier might have been compromised by the initial sepsis causing increased permeability for tobramycin [4]. Secondly, our patient was malnourished as a result of chronic illness and frequent periods of retention of enteral feeding. Malnutrition is associated with increased movements of large molecules through the paracellular tight junction in jejunal epithelia [5]. Thirdly, our patient had a blinded jejunal loop which could act as reservoir for tobramycin.

The amphotericin B levels were not measured but could also be increased. The nephrotoxic effect of parenteral administration of amphotericin B is well known. No other medication could explain the acute renal failure.

This case indicates that patients with altered abdominal anatomy and/or perforations and/or malnutrition might be at risk to develop nephrotoxicity from SDD, especially when SDD is administered via several routes. Besides the current debate about the effects of SDD on antibiotic resistance, no complications of tobramycin-related toxicity are reported in more than 50 randomized

controlled trials. Future studies on SDD should also incorporate such safety analyses.

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