

# Bilateral Symmetrical Ureteric Strictures following Aortobifemoral Grafting for Emergency Repair of a Ruptured Abdominal Aortic Aneurysm: A Case Report

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## Abstract

Ischaemia of the abdominal organs is a potential complication of aortic aneurysm surgery. Ischaemic bowel strictures following aortic surgery have already been previously described but the authors believe this to be the first report of bilateral ureteric strictures of possible ischaemic origin following emergency aortobifemoral grafting for a ruptured abdominal aortic aneurysm.

## INTRODUCTION

Abdominal Aortic Aneurysm (AAA) repair is known to have many local complications related to post-operative ischaemia of the abdominal organs, but so far no cases of bilateral ureteric strictures has been described. Two cases of ischaemic rectal strictures related to AAA repair<sup>1,2</sup> as well as jejunal strictures following endovascular AAA repair have however been documented<sup>3</sup>. The ureter derives its blood supply in a segmental fashion with a large degree of variability<sup>4</sup>. The upper part is supplied by the renal arteries with the middle portion supplied by branches from the aorta, gonadal, common iliac and internal iliac vessels. The lower portion is supplied by the inferior vesical artery in the male and uterine artery in the female both of which originate from the internal iliac arteries. It is therefore possible that a local disruption in blood supply may result in subsequent ischaemic stricture formation.

## CASE REPORT

A 67 year old male Caucasian presented with frank haematuria and was subsequently found to have a superficial bladder neoplasm.

Eighteen months previously, he had presented as an emergency admission with a ruptured AAA. At that time he had an aortobifemoral graft with ligation of both common iliac arteries. At operation there was no evidence of an inflammatory aneurysm or of generalised retroperitoneal fibrosis. Both ureters were easily identified and preserved

during the procedure. The distal limbs of the graft were anastomosed "end to side" to the superficial femoral arteries and as a result any pelvic viscera normally dependant on an arterial supply distal to the aortic bifurcation would be dependant on retrograde blood flow via the grafted superficial femoral vessels.

In order to investigate his haematuria an intravenous urogram was performed. This showed sub-optimal filling of both upper tracts but did not demonstrate any lower ureteric pathology. He was investigated by cystoscopy and a superficial transitional cell carcinoma of the bladder was found and resected.

In order to clarify the anatomy of his upper tracts it was intended to perform bilateral ureteroscopy at the time of cystoscopy. This however proved impossible due to the unexpected finding of bilateral lower ureteric strictures at the level of the sacro-iliac joints and this was confirmed by retrograde ureterography (see figures 1 and 2).

**Figure 1**

Figure 1: Retrograde ureterogram of right ureter demonstrating stricture at level of the sacro-iliac joint.



**Figure 2**

Figure 2: Retrograde ureterogram of left ureter demonstrating structure at the level of the sacro-iliac joint.



Retrograde J stents were passed and repeat ureteroscopy after 3 months allowed successful visualisation of the upper tracts which proved to be essentially normal. Ureteric biopsy at the site of the previous stricture showed inflammatory change consistent with ischaemia but with no evidence of urothelial malignancy.

The ESR was normal at 6 mm/hr and abdominal computed tomographic (CT) scanning showed no evidence of any

extrinsic pathology to account for ureteric stricture formation. A specific comparison of the retrograde ureteric studies with the CT images of the pelvis showed no evidence of late graft-related localised fibrosis involving the ureter corresponding to the level of the observed ureteric strictures.

## DISCUSSION

The differential aetiology of ureteric stricture following abdominal aortic aneurysm repair includes direct operative trauma, generalised retro-peritoneal fibrosis, inflammatory aneurysm, and secondary graft related localised fibrosis involving the ureter as well as intrinsic ureteric causes. Theoretically segmental ureteric ischaemia due to localised interruption of arterial supply could also result in long term stricture formation. In this case the operation note confirms the ureters were identified and preserved and that there was no evidence of generalised retroperitoneal inflammation at the time of surgery. The CT scan at the time of bilateral ureteric stricture diagnosis 18 months after his aneurysm surgery showed no evidence of generalised retroperitoneal fibrosis or malignancy, nor any evidence of localised graft related fibrosis. The patient had no history of previous ureteric instrumentation or of urinary tract stone formation nor was there any evidence of primary urothelial malignancy involving his urinary upper tracts. It would seem reasonable to conclude therefore that in this case, bilateral lower ureteric strictures have developed following aorto bifemoral grafting as a result of compromised local arterial supply to the ureter.

The authors believe this to be the first such case to be described and ischaemia should be included in the differential aetiology of cryptic ureteric stricture formation in patients who have had previous aortic aneurysm surgery.

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