Case Study of the Month

Refractory Hematuria in an Oliguric Patient After Pancreas Transplantation with Exocrine Pancreas Bladder Drainage

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1. Case report

A 52-yr-old man presented to our department with hematuria and clot retention. He had undergone simultaneous pancreas–kidney transplantation with exocrine pancreas bladder drainage 16 yr ago. The patient suffered from progressive transplant kidney failure with gradually decreasing urine output (<800 ml/d) and end-stage renal failure requiring hemodialysis every other day. Several endourological procedures were required because of urethral strictures during the ensuing years. Of note, the pancreas transplant remained fully functional, as documented by euglycemia in the absence of insulin and normal C-peptide levels.

The bladder was evacuated, but gross hematuria persisted. Cystoscopy revealed multiple small, flat ulcers of the bladder mucosa (Fig. 2). Some of these bled discretely and were coagulated cautiously. There was no pathology in the transplanted duodenal segment (Fig. 3). Histological examination of the bladder tissue showed small granulating ulcers covered with fibrin (Fig. 4). In the following period, recurrent gross hematuria needing urological interventions (especially after hemodialysis) still persisted. To compensate for the highly alkaline urine (pH 9), an acidic solution (Urotainer Suby G, pH 3.6 [B. Braun Melsungen AG, Melsungen, Germany]) was instilled into the bladder thrice daily to achieve an acidic urine. However, episodes of gross hematuria persisted, which eventually led to a diversion of
the exocrine pancreas. The pancreatico-duodenal bladder drainage was diverted into an enteric drainage by end-to-side anastomosis of the transplanted duodenum to an adjacent ileal loop. The postoperative course was uneventful, without further episodes of gross hematuria and with ongoing preserved endocrine pancreatic function.

2. Discussion

*En bloc* pancreatico-duodenal transplantation with diversion of the exocrine pancreatic secretions into the bladder was the technique of choice in the late 1980s and 1990s, as it was safer to perform and was associated with less postoperative complications than enteric drainage. In addition, amylase concentration in the urine allowed for monitoring a possible transplant rejection [1]. However, exocrine pancreas bladder drainage results in urological complications in up to 83% of patients [2]. The most common complications are hematuria, recurrent lower urinary tract infection, and urethral strictures [3]. The complications are caused by exocrine pancreatic secretions (bicarbonate, amylase, lipase, and several proenzymes such as trypsinogen, chymotrypsinogen, and procarboxypeptidases) draining into the bladder and creating a powerfully erosive environment [3]. In light
of the fact that the patient reported had no previous history of repeat gross hematuria as long as diuresis was normal, we assumed that in that patient, the decreasing urine output resulting from progressive transplant kidney failure resulted in higher urinary pancreas enzyme concentration, leading to “pancreatic digestion of the bladder” with multiple bladder ulcers. In addition, the urinary pH was 9, and it is well known that activated pancreatic enzymes in conjugation with alkaline urine can exacerbate mucosal damage [3].

In patients with bladder-drained pancreatic transplantation, preoperative bladder function poorly predicts urological complications [4], and late-onset chronic hematuria is usually associated with duodenal ulceration, cytomegalovirus (CMV) infection, chemical cystitis, pancreatitis, and rejection [2]. In our patient, however, the duodenal segment was normal, and the pancreas transplant showed no signs of inflammation. The classical management of hematuria includes bladder catheterization and irrigation, the next step being cystoscopy, if necessary, with fulguration. In the case of refractory hematuria, an enteric diversion [5] should be considered.

Conflicts of interest: Thomas M. Kessler has acted as a consultant for Medtronic.

References


EU-ACME question

Please visit www.eu-acme.org/europeanurology to answer the following EU-ACME question online (the EU-ACME credits will be attributed automatically).

Question:

Which of the following statements is correct regarding simultaneous pancreas–kidney transplantation with diversion of the exocrine pancreatic secretions into the bladder?

A. Urological complications are rare.
B. Lipase concentration in the urine allows for monitoring a possible transplant rejection.
C. In the case of refractory hematuria, an enteric diversion of the exocrine pancreas should be considered.
D. Nowadays, diversion of the exocrine pancreatic secretions into the bladder is the technique of choice in simultaneous pancreas–kidney transplantation.