

Duodenal Segment Associated Complications following Combined Kidney/Pancreas Transplantation

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=국문초록=

신장/췌장 동시 이식후 방광배액술과 관련된 합병증에 대한 고찰

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췌장이식에서 췌장과 십이지장의 일부를 이용하여 췌장의 외분비액을 배액하는데 사용하는 술식이 현재 가장 많이 사용되고 있는 방법이나, 십이지장을 방광 또는 소장에 문합하는 술기의 장단점에 관하여 계속 논란이 있어 왔다. 저자들은 오하이오 주립대학병원에서 십이지장과 방광을 문합하여 췌외분비선을 배액한 200명의 신장 및 췌장 동시 이식환자들을 대상으로 십이지장-방광 문합술후 십이지장과 관련된 합병증을 조사하여 빈도, 치료 방법 및 예후에 관하여 연구하였다. 혈뇨와 십이지장 누출이 가장 많은 합병증이었으나 다른 기관들에서 발표하였던 결과와는 대조적으로 대부분의 환자에서 보존적 방법으로 치료가 가능하였다. 또한 십이지장과 관련된 합병증으로 인하여 방광 배액에서 소장 배액으로의 전환예가 3예에 지나지 않았다. 결과적으로 저자들이 사용하고 있는 술식의 결과가 양호하며 십이지장과 관련된 합병증의 대부분에서 보존적 치료가 유용함을 확인할 수 있었다.

Whole organ pancreas transplantation with duodenocystostomy is the most commonly employed technique in the United States. The best method for drainage of the exocrine secretion of the graft remains controversial due to the occurrence of either urologic complications or bowel leaks with sepsis. Some authors have employed a higher rate of enteric conversion due to urologic complications. Duodenal segment complications have emerged as an adverse event of the procedure. We have reviewed our experience with the duodenal segment related complications of 200 consecutive type I diabetic recipients of combined kidney/pancreas transplants (KPT). Hematuria occurred in 11% and bladder leaks 10% of recipients. Non-operative management was feasible in a large number of patients.

MATERIALS AND METHODS

Two hundred consecutive uremic type I diabetic patients underwent KPT at the Ohio State University Hospitals between March, 1988 and July, 1993.

Recipient operation

All grafts were procured from heart beating donors. The pancreas and liver were removed en bloc and separated at the back table. The donor common iliac artery is used in all cases to fashion a single artery for engraftment. Proximal and distal duodenal end are stapled and the staple line is enforced using absorbable monofilament sutures. All pancreatic transplantations were performed using the whole organ with duodenocystostomy for exocrine drainage. Duodenocystostomy is constructed in two layers

of monofilament absorbable sutures. Immunosuppressive protocols consisted of induction of anti-lymphocyte agents followed by triple immunosuppression using cyclosporine, prednisone and azathioprine. Patients have been followed for 12 to 77 months.

RESULTS

Hematuria

Hematuria was seen in 22 patients. Hematuria was defined as persistent blood in the urine for more than 48 hours. Patients were divided into three groups: 1) immediate hematuria occurring within 1 month post-transplantation, 2) delayed occurring hematuria during a subsequent hospitalization with 3 months, 3) late hematuria occurring later than 3 months. Hematuria presented early in the majority of episodes(45%) and required no operative intervention. Cystoscopy with or without cauterization was needed in nine patients. At cystoscopy, bleeding from the anastomosis was found only in four episodes in immediate hematuria group and in the majority of these cases a discrete bleeding point was not identified. Five episodes occurred in the delayed group and duodenal ulceration were identified as a source of hemorrhage in three patients. One patient developed recurrent hematuria and required enteric conversion eight months post transplantation. This patient had recurrent episodes of systemic cytomegalovirus (CMV) infection. However immunoperoxidase staining of the resected ulcer failed to identify CMV antigen. In the late group, there have been a total of 12 episodes. Duodenal pathology was found in four patients and cystitis in one. Cystoscopy with or without cauterization was effective in controlling the bleeding in eight episodes. One patient required enteric conversion for persistent hematuria. Therefore a total of two patients required enteric conversion for persistent hematuria.

Bladder leak

Bladder leaks occurred in 20 patients. All bladder leaks were documented radiologically using cystogram or voiding cystourethrogram. Urine leaks were divided into two

groups: 1) early leaks presented within 3 months post transplantation and 2) late leaks presented after three months. Fourteen leaks occurred early. Fever and wound drainage were common among these patients. Eight were treated with Foley catheter drainage. Surgical repair was needed in six patients. At operation all cases of early leaks were due to anastomotic leak at the duodenocystostomy. Six patients presented with late leaks. Increased in urine amylase and abdominal pain were the main leading features of late leaks. Four of these patients required surgical repair. At the time of operation all leaks were found at the distal duodenal segment. Biopsies of the perforated area showed chronic inflammation, but CMV was not detected. One patient developed a recurrent leak eight months post repair and was treated with enteric conversion.

DISCUSSION

Bladder drainage of the exocrine pancreas is associated with multiple urologic complications. Hematuria was a relatively common complication in this series as reported by others (). Initial treatment with continuous bladder irrigation (CBI) was effective and was not itself associated with complications. Cystoscopy, with or without cauterization, was effective as a second line of treatment with CBI failed. Delayed hematuria occurred during the period when acute rejection and CMV had peaked, in our experience. However in these patients, its occurrence did not coincide with the presence of acute rejection, therefore it is unlikely to be secondary to an immunological etiology. One of these patients developed hematuria with two episodes of systemic CMV infection, but staining of the duodenal ulcer at the time of his enteric conversion failed to detect any CMV. Irrigation of the bladder with saline and a large caliber catheter is mandatory to remove any blood clots prior to starting CBI. Sudden distention of the bladder previously filled with clots may disrupt the suture line and result in bladder leak. In contrast to other reports, enteric conversion for recurrent hematuria have been uncommon in this series. Only 1% of all recipients required enteric

conversion for recurrent hematuria.

Urine leaks from the duodenal segment continue to be a cause of morbidity. Most of the duodenal leaks in this series occurred early postoperatively presumably due to technical reasons. These cases traditionally have been managed in our series with Foley drainage encourages use of this approach as the initial method unless there is a contraindication such as peritonitis.

Late leaks have been reported with no clear identity to etiology or clinical features. In this series, six recipients presented with rising serum amylase, intermittent fever, abdominal pain and were found to have bladder leaks. In these cases, a cystogram is indicated to rule out presence of bladder leak. This test was diagnostic in all of our cases with the exception of a single patient who had three normal cystograms and the only positive diagnostic test was voiding cystourethrogram. At the time of surgery, all the late leaks were found in the distal duodenal segment which indicate non technical causes for the leak. Repair using monofilament absorbable sutures was adequate in all and no immediate recurrence was noted. One patient did develop recurrent leak eight months per repair requiring enteric conversion as reported by others

The etiology of the late leaks remains obscure. Certainly acute rejection and CMV duodenitis may represent possible etiological factors. However in this group, there was no evidence of lymphocytic infiltrate nor the inclusion bodies and CMV staining was negative. Chronic duodenal ulceration as a result of continuous alkalization of the duodenal segment may play a role in the etiology of late leaks. The anastomotic site of these leaks is the most distally perfused segment of the duodenum. Theoretically the distal duodenal segment is more dependent and most likely have higher pressure and are more susceptible to chronic ulceration. Late leak should be ruled out as a cause of abdominal pain and increased serum amylase in a perfectly stable recipient.

It is noteworthy that our rate of enteric conversion due to urologic complications in this series is extremely low (2%) in comparison to others. The threshold for enteric conversion is certainly decreasing due to the safety of the

procedure, however preservation of bladder drainage may still be helpful to follow urine amylase as a marker for allograft function.

To summary, bladder drainage continuous to provide good patient and graft survival. Urologic complications are common following this procedure but most are manageable conservatively. These complications did not impact directly on pancreatic or renal graft outcomes. Enteric conversion was indicated in a very low number of patients in our series.

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