

Ultrasound-guided biopsy of transplanted pancreas: evaluation of 20 cases

Biópsia de pâncreas transplantado guiada por ultrassonografia: avaliação de 20 casos

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ABSTRACT

Objective: To report the experience with percutaneous biopsies of pancreatic grafts guided by ultrasonography. **Methods:** Series of cases referred from outpatient's clinic for biopsy of pancreas transplant, between December 2006 and March 2008. Data were collected from medical electronic records for age, sex and histopathology. The indication for the procedure was obtained from medical and laboratory records. Doppler ultrasonography was performed for control and to guide biopsy in real time. **Results:** Twenty patients referred for biopsy of their transplanted pancreas over a one-year period were evaluated. In one patient, biopsy was not performed for having no safe access for ultrasound. It was used 18 gauge needles, mostly automatic-cut type. The main indications were increased blood glucose and pancreatic enzyme levels as well as reduction of urinary amylase. The sonographic aspect of the pancreatic graft was normal in 18 cases. In all 19 biopsies performed, satisfactory samples for histopathological study were obtained. There were no complications. **Conclusions:** This series of cases demonstrated low sensitivity and specificity of ultrasound in diagnosis of pancreatic transplants disorders, but showed to be very useful to guide transplanted pancreas biopsies. Although no complications occurred in this experience, the risk-benefit relation should always be assessed for every patient.

Keywords: Pancreas transplantation; Biopsy, needle; Ultrasonography; Graft rejection

RESUMO

Objetivo: Relatar experiência com biópsias percutâneas de enxerto pancreático guiadas por ultrassonografia. **Métodos:** Série de casos encaminhados ambulatorialmente para biópsia de pâncreas

transplantado no período de dezembro de 2006 a março de 2008. Dados referentes à idade, sexo e resultados histopatológicos foram colhidos a partir dos registros de prontuários eletrônicos. A indicação do procedimento foi obtida a partir dos pedidos médicos bem como de registros laboratoriais. A ultrassonografia com Doppler foi realizada para controle antes e após o procedimento e para guiar a punção em tempo real. **Resultados:** Vinte pacientes encaminhados para biópsia de pâncreas transplantado no período de um ano foram avaliados. Em um paciente, a biópsia não foi realizada por falta de uma via de acesso segura por ultrassom. O aspecto ultrassonográfico do órgão transplantado foi normal em 18 casos. Em todas as 19 biópsias executadas, foram obtidas amostras satisfatórias para o estudo histopatológico e não houve complicações. **Conclusões:** Esta série de casos reforça as baixas sensibilidade e especificidade da ultrassonografia no diagnóstico de disfunções de enxertos pancreáticos, porém mostra sua grande utilidade no auxílio de biópsias do órgão transplantado. Apesar de não terem ocorrido complicações nesta experiência, o procedimento deve sempre ser avaliado quanto ao risco-benefício para todos os pacientes.

Descritores: Transplante de pâncreas; Biópsia; Biópsia por agulha; Ultra-sonografia; Rejeição de enxerto

INTRODUCTION

Despite the many advances in pharmacology and insulin therapy, the complications of *diabetes mellitus*, such as vision loss, accelerated atheromatosis, dyslipidemia, heart and cerebrovascular diseases, as well as amputations, are common events with significant impact on quality of life.

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For such patients, combined kidney and pancreas transplantation has been an alternative for quite a few years, increasingly used due to advances on immunosuppression and to refinement of surgical techniques⁽¹⁾. The greatest advantage of such treatment is to relieve patients from insulin therapy and hemodialysis, although a strict outpatient follow-up is necessary.

Clinical control of patients with pancreatic grafts is difficult, since both sensitivity as well as specificity of laboratory parameters to measure graft function are low. Hyperglycemia, for instance, usually occurs in stages of advanced rejection⁽²⁾ and up to 40% of cases of acute rejection may occur without significant laboratory changes⁽³⁾.

Ultrasound and computed tomography (CT) scan, although quite useful to identify vascular complications, fluid collection and even infections, have a limited diagnostic performance to identify rejection, which occur in up to 2% of patients in the first year⁽¹⁾.

Therefore, a histological study of the pancreatic graft is often necessary, since that is considered the gold standard for the etiologic definition of laboratory test alterations⁽⁴⁾. The main approaches to collect samples are percutaneous (imaging-guided using CT scan and/or ultrasound), cystoscopy and surgery – either laparoscopic or open access⁽⁵⁾.

OBJECTIVE

To present a series of cases in which pancreatic grafts biopsies were done, guided by ultrasound, aiming to describe success and complication rates of such technique, as well as to report the correlation between imaging and histology.

METHODS

Series of cases referred for biopsy of transplanted pancreas from the outpatient's clinic, between December 2006 and March 2008. Data concerning age, sex and histopathology were collected from the electronic records. The indication for the procedure was given by medical request, as well as laboratory records.

All procedures were carried out by a single radiologist trained in radiology-guided interventions, with a five-year experience.

The ultrasound prior to the procedure was done using a Phillips ultrasonographer, Envisor model, with a 2-5 Mhz abdominal convex transducer (which provides a larger field and more penetration, giving a broader view of the abdominal cavity) and a 9-12 Mhz linear transducer (less penetration but high-

spatial resolution, allowing a better assessment of the graft parenchyma). The objective was to assess the presence of peritoneal fluid before and after the biopsy; identify the regional vessels and guide the procedure in real time.

All biopsies were done with 18 gauge automatic or manual needles. At least two fragments were collected for each patient. In some cases, a third one was removed, if immunofluorescence had been ordered by physicians. Approximately 2 cm long fragments with color and texture suggestive of pancreatic parenchyma were considered as appropriate for histopathology.

RESULTS

Twenty indications for biopsy were evaluated. In one of the indications, the biopsy was not performed since the graft was quite narrow, close to regional vessels and interposed between bowel loops, hindering a safe approach guided by ultrasound. The remaining 19 procedures were performed in 15 patients, nine men and six women, mean age of 26 years (ranging from 14 to 50 years) with a mean transplantation time of 23 months (ranging from 1 to 60 months).

The main clinical indications for the procedure were increased pancreatic enzyme levels, especially lipase (ten patients), blood glucose alterations (nine patients) and reduced urinary amylase (two patients).

In 18 cases, automatic needles were used and in only one patient a manual needle was preferred. In all cases the fragments were considered satisfactory macroscopically, and there were no complications related to the procedure.

Histology was compatible in 18 cases with different phases of rejection (five acute, seven chronic and four mixed). One patient was diagnosed with pancreatitis, with no signs of rejection and in another patient the histopathology was normal.

In spite of the different histopathologic results, in all cases the assessment using the B method did not show significant alterations. One case showed decreased blood flow on Doppler and the pathology result was of chronic rejection. Some cases are depicted in Figures 1, 2 and 3.

DISCUSSION

By and large, graft dysfunctions in transplanted patients should be diagnosed as soon as possible to avoid irreversible damages. Nevertheless, the laboratory, ultrasound and tomographic scans presented unsatisfactory sensitivity⁽⁶⁾.

Graft vascular alterations are also present in the course of rejection processes. Hence, Doppler

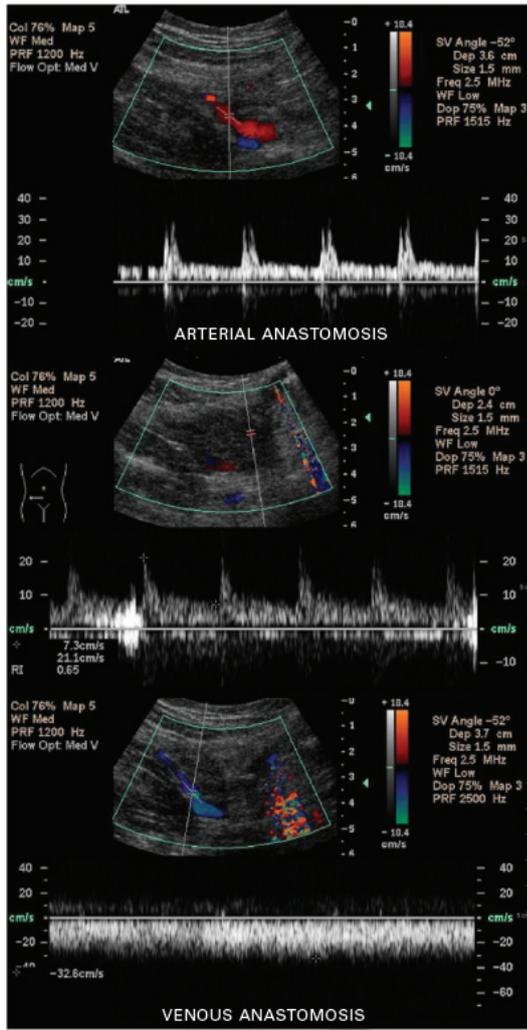


Figure 1. A 20-year-old male patient. Pancreatic transplant four months ago, progressing to increased glucose levels (400 mg/dl). The images show a normal Doppler study with preserved arterial and venous anastomoses and intraparenchymal flow. The histopathology revealed mild acute rejection

studies were performed searching for associations of alterations with spectral curve parameter. They showed that the resistance index tends to be higher in cases of chronic rejection, but are not satisfactory for the cases of acute rejection⁽⁶⁻⁷⁾. In the present experience, the patient with the most intense chronic rejection histology had a decreased parenchymal flow on Doppler.

Therefore, histopathology is accepted as the gold standard for diagnosis of rejection⁽⁸⁾. Nowadays, cystoscopy, percutaneous and transduodenal approaches have replaced surgeries to collect graft specimens.

Performance and complication rate of the CT scan-guided percutaneous approach and cystoscopy are good and similar⁽⁹⁾, but patients who undergo biopsy using cystoscopy have to be admitted to hospital even if there are no complications; the total time of the procedure is relatively long, and it has to be done in an operating

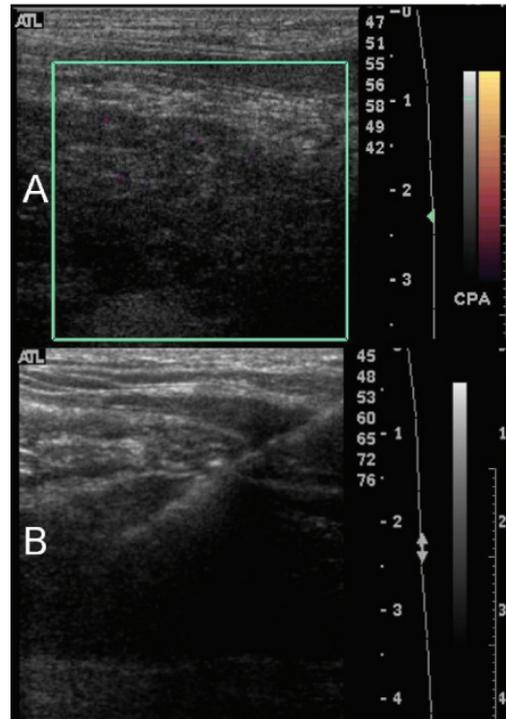


Figure 2. A 32-year-old female patient. A: Doppler of pancreatic graft shows reduced parenchymal vascularization. B: Ultrasound-guided biopsy of pancreatic graft. Histology showed severe chronic rejection in acute phase

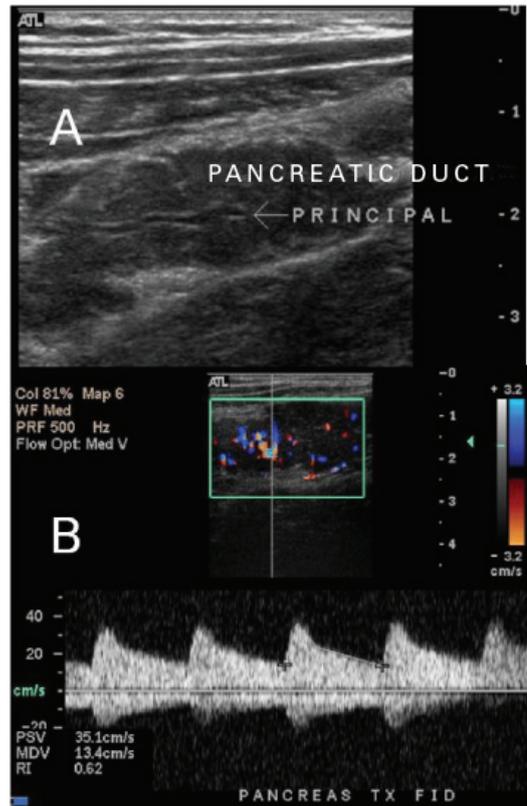


Figure 3. A 31-year-old male patient. Pancreatic transplant four years ago, progressing to increased serum lipase levels. The images show a normal Doppler ultrasound study with no alterations. Histopathology revealed mild chronic rejection

room under general anesthesia⁽¹⁰⁾. CT scan-guided percutaneous biopsy is also relatively time-consuming when compared to the ultrasound-guided biopsy, besides using ionizing radiation⁽¹¹⁾.

Results show that the ultrasound-guided biopsy is safe and can often obtain appropriate fragments. Some studies showed that this technique has comparable results to the other methods mentioned above, in addition to being cheaper and quicker⁽⁵⁾. Sometimes there may not be a safe tract or an adequate acoustic window, for which cases it is suggested the alternatives guided by CT scan or cystoscopy.

It is stressed that in most patients it is possible to access the transplanted pancreas through ultrasound. In the most difficult cases, mostly those in which there is gas interposition, a narrow graft close to the regional vessels, it is reminded that before the procedure, it is worth trying to mobilize the bowel with position maneuvers even the use of manual needles, since this device allows better control on advancing the needle.

CONCLUSIONS

Considering the low sensitivity and specificity of biochemical markers and of the ultrasound in diagnosis of pancreatic graft dysfunction, biopsies are often necessary. Since the ultrasound-guided percutaneous approach has been proved safe, effective and relatively cheap, it is believed that most of the times it may be considered as preferential.

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