Duplex ultrasound is widely used to detect vascular dysfunction after kidney transplantation. We describe musical murmurs found in renal allografts.

A 29-year-old man with an increase in serum creatinine 1 month after cadaveric kidney transplantation was referred for duplex ultrasound to exclude perfusion dysfunction. Renal arterial and venous circulation was normal. However, during Doppler spectral recording, a loud “seagull cry” was audible (audio file in the online-only Data Supplement). Spectral analysis displayed mirror-image parallel strings and bands of low to moderate frequency (Figure 1A and B). A small arteriovenous fistula, presumably after previous biopsy, was detected as cause of the turbulent flow. Inasmuch as no bleeding complication or pseudoaneurysm formation occurred, a conservative strategy was chosen, and follow-up with duplex ultrasound was recommended.

A 49-year-old woman was referred for duplex ultrasound during her first annual follow-up visit after cadaveric renal transplantation. Duplex ultrasound revealed a narrowing of the transplant vein with turbulent flow and increased peak systolic velocity up to 200 cm/s in the middle part (Figure 2A). Furthermore, spectral analysis showed a turbulent pulsatile spindle signal (Figure 2B), and a high-frequency “seagull cry” was clearly audible. Renal function was normal, and no signs of venous congestion were present; therefore, no further intervention was necessary.

Duplex ultrasound performed during the first follow-up visit after cadaveric renal transplantation in a 50-year-old woman revealed an audible high-frequency pulsatile sound in the transplant renal artery. Peak systolic velocity increased from 110 cm/s to 250 cm/s, indicating renal artery stenosis (Figure 3A and B). Doppler spectral analysis showed a turbulent systolic spindle signal (Figure 3C). However, intrarenal spectral waveforms were normal, as were renal function and blood pressure, and therefore hemodynamic relevant stenosis was unlikely. After the color display was optimized, a kink of the renal artery directly after the anastomosis was seen. Severe kinking of the transplant artery is a rare but relevant cause of early graft dysfunction, and surgical resection is recommended. However, in this patient, renal function remained normal, and peak flow velocity in the kink did not change over the next 2 years.

Seagull cry, also called “goose cry” or “cooing murmur,” is an outstanding acoustic phenomenon in duplex ultrasound and indicates severely disturbed flow. Musical murmurs have been described in color-coded carotid and transcranial duplex ultrasound and imply such severe vascular diseases as high-grade carotid artery stenosis, arteriovenous fistula, and Moyaji.
moya disease. Doppler spectral analysis commonly detects mirror-image parallel strings (Figure 1) or bands of low to moderate frequencies (Figures 2 and 3) caused by flow acceleration and turbulence along the vessel. An experienced sonographer may be able to correctly identify the cause of the musical murmurs and its impact on renal function.

In addition to the 3 cases described here, we have observed the phenomenon of musical murmurs in patients directly postoperatively after renal transplantation with severe perfusion dysfunction and graft failure. However, in this situation, urgent surgical revision was necessary to rescue transplant function. To our knowledge this is the first report of “seagull cry” in color-coded duplex ultrasound after renal transplantation.

Figure 2. A, Color-coded ultrasound shows transplant renal artery (red) and vein (blue); renal vein stenosis with increased (yellow and white) and turbulent flow (green). B, Doppler spectral analysis shows a peak flow velocity of 180 cm/s of the renal vein with a concomitant low frequent systolic spindle band (arrows).

Figure 3. A, External iliac artery in the region of the renal artery anastomosis with “confetti phenomenon.” B, Transplant artery (pulse repetition frequency 65.9 cm/s) with a kink and increased (yellow and white) and turbulent flow (green). C, Doppler spectral analysis shows a peak flow velocity of 250 cm/s of the renal artery with a concomitant low frequent systolic spindle band (arrows).

Disclosures

None.

References


"The Seagull Cry": A Sign of Emergency after Renal Transplantation?
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Circulation. 2010;121:e25-e26
doi: 10.1161/CIRCULATIONAHA.109.889113

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