Pancreatic Allograft Thrombosis: Suggestion for a CT Grading System and Management Algorithm

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Introduction:

- Pancreatic allograft thrombosis remains the leading cause of non-immunological graft failure.
- There is currently no consensus on the reporting and management of partial pancreatic allograft thrombosis.
- Herein we propose a new CT grading system of pancreatic allograft thrombosis for identification of patients at risk of allograft loss and outline a management algorithm.

Methods:

- Retrospective review of all consecutive pancreatic transplants performed at our centre between 2009 and 2014.
- Triple phase CT scans were retrospectively graded independently by two radiologists as;

Grade 0 – No allograft thrombosis
Grade 1 – Tiny distal or peripheral thrombosis
Grade 2 – Intermediate non-occlusive thrombosis
Grade 3 – Proximal and occlusive thrombosis

Results:

- 103 consecutive pancreatic transplants were performed, of which 24 (23.3%) were diagnosed with allograft thrombosis.
- Three grafts were lost due to thrombosis [all portal vein thrombosis (two grade 3 and one grade 2); 2.9%].
- All 24 patients were started on therapeutic anticoagulation.
- Re-exploration rate for bleeding was 33.3% for thrombosis group and 15.2% for no thrombosis group.
- On multivariate analysis, pancreas after kidney transplant (OR 1.09, CI 0.01-0.97, p=0.047), acute rejection (OR 1.25, CI 0.07-0.90, p=0.034) and CT finding of pancreatitis (perigraft fat stranding) (OR 1.23, CI 0.08-0.72, p=0.011) were risk factors of allograft thrombosis.
- Retrospective review of CT images revealed more grade 1 and 2 thromboses than were initially reported.

Four grade 2 and one grade 3 arterial thrombosis were anticoagulated without exploration and all have functioning grafts. Two grade 2 and two grade 3 venous thrombosis were re-explored, of which two patients needed pancreatectomy. One grade 2 and two grade 3 venous thrombosis were anticoagulated and all patients have functioning grafts.

There was no difference in graft or patient survival, length of stay or morbidity between the patients with grade 1 and 2 thrombosis who were anticoagulated (n=11) and with those who were not anticoagulated (n=26)

Discussion:

- Based on our proposed grading system, our data suggest that grade 1 and 2 arterial thrombosis and grade 1 venous thrombosis can be managed safely without formal anticoagulation, thereby lowering the risk of immediate post-operative bleeding complications and associated morbidity.
- The proposed grading system will assist clinicians in decision making and can be used in future studies to provide standardised scoring to further interrogate the impact of thrombosis on outcome.

Grade 1 venous - small volume of thrombus in the distal SMV

Grade 2 venous - thrombus in the distal SV

Grade 1 arterial - minimal thrombus in the distal SA

Grade 2 arterial - thrombus extending into the mid SMA