Ex-Vivo Analysis of Kidney Graft Viability Using $^{31}$P Magnetic Resonance Imaging Spectroscopy

Marginal kidney for transplant

Use or discard?

Ex vivo assessment

$^{31}$P MRI spectroscopy:
- ATP metabolism
- Perfusion characteristics

Porcine kidneys exposed to varying warm ischemia prior to explant

Re-oxygenation by hypothermic machine perfusion

Ex-vivo MRI with Gd-DTPA and MR spectroscopy

Histological assessment of ischemic injury

The longer the duration of warm ischemia on kidneys resulted in:

↓ ATP levels

↓ Kidney perfusion

↑ Histological injuries

Refine viability assessment and potentially ↓ discard rates


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