

What are the non-surgical causes of renal failure in a patient with a kidney transplant?

1. Allograft rejection Classification by clinical course (timing) and by immunologic mechanisms

	<b>Cellular rejection</b> (T cell mediated immunity)	<b>Humoral rejection</b> (Ab → C' → polys → vasc damage)
<b>Hyperacute rejection</b> (Preformed antibodies minutes to hours)		<i>Acute thrombotic microangiopathy</i>  <i>Renal infarction</i>
<b>Acute rejection</b> (days to months)	<i>Interstitial nephritis</i> Lymphocytic tubulitis (CD8+ T cells) Delayed hypersensitivity (CD4+ T cells and macrophages)  <i>Endovasculitis (endotheliitis)</i> Intimal CD8+ T cells  <i>Acute glomerulitis</i>	<i>Necrotizing arteritis</i>  <i>Acute thrombotic microangiopathy</i>  <i>Peritubular capillaritis</i> (complement C4d staining)  <i>Renal infarction</i>
<b>Chronic rejection</b> (months to years)	<i>Obliterative arterial intimal fibrosis</i> <i>Renal parenchymal ischemic atrophy and fibrosis</i> <i>Chronic microangiopathy ("chronic transplant glomerulopathy")</i>	

2. Calcineurin inhibitor toxicity
  - a. Vascular toxicity (vasoconstriction; *thrombotic microangiopathy*)
3. Ischemic/nephrotoxic acute tubular necrosis
4. Kidney infection
  - a. Opportunistic (Polyoma virus, Cytomegalovirus, Adenovirus)
  - b. Pyelonephritis
5. Recurrent disease ("Primary" FSGS; DDD; "Atypical" HUS; IgA; many others)
6. De novo diseases (Membranous glomerulopathy; Collapsing glomerulopathy; Anti-GBM in Alport's patients; others)

**Urinary tract infection**

1. Who gets UTI? What are the common microbes?
2. What are the clinical presentations of UTI?
  - Lower tract infection (urethritis and cystitis): Frequency dysuria syndrome
  - Upper tract infection (acute pyelonephritis, and intrarenal or perinephric abscesses): Systemic inflammatory response; CVA tenderness
3. What is the route of infection in acute pyelonephritis?
  - Ascending vs. hematogenous
4. What is "uncomplicated" UTI? ("Trauma"; P fimbriae; cranberry juice)
5. What are the mechanisms / predisposing factors in complicated UTI?
  - Anatomic abnormalities; stones or other obstruction; instrumentation; pregnancy; immunosuppression; kidney disease; diabetes
6. What is reflux nephropathy?
  - Incompetent vesicoureteral valve
  - "Big bang" hypothesis