Lithium Nephropathy

49-year-old male patient with recent splenectomy and a background of hypogammaglobulinaemia, COPD, schizophrenia, hypertension and hypothyroidism. The patient was having a routine post-operative ultrasound when this characteristic appearance on ultrasound was noted incidentally on the kidneys. On review of the biochemistry the Creatinine has been persistently mildly elevated.

Imaging Findings:

Figure 1 - Ultrasound (longitudinal section) of the right kidney/liver.
Figure 2 - Ultrasound (longitudinal section) of the left kidney.
Figures 1 and 2 demonstrate numerous punctate echogenic foci and microcysts, mainly within the cortex of the kidney.

Figure 3 - 5mm axial CT slice through the level of the kidneys
Figure 4 - Coronal reformatted images of the Chest, Abdomen & Pelvis.
Figures 3 and 4 demonstrate the multiple microcysts bilaterally, predominantly within the cortex.

Discussion:

Chronic lithium use in bipolar and other mental health disorders has been associated with various forms of renal toxicity, the most common being nephrogenic diabetes insipidus [1]. Rarely, lithium use can also result in nephrotic syndrome, renal tubular acidosis and nephropathies. The most common form of chronic nephropathy from lithium use is tubulointerstitial nephropathy. This is characterised by microcysts (1-2mm) and interstitial fibrosis on renal biopsy [2]. The degree of fibrosis is related to duration and cumulative dose of lithium [3].

The onset of renal impairment is usually gradual in patients on long term lithium. The degree of renal impairment is usually mild, however it slowly progresses onto end stage renal failure [3].

On ultrasound, there is a characteristic appearance of microcysts with punctate echogenic foci, which are classically uniform in size and found within both the cortex and medulla [4]. The imaging findings can also be appreciated on CT where they appear as hypodense microcysts occasionally displaying micro-calcification. On MRI, T2 weighted
imaging shows small hyperintense round lesions within the medulla and cortex [5].

The treatment is cessation of lithium therapy, however, renal impairment may be progressive [2].

**Differential Diagnosis List:** Lithium tubulointerstitial nephropathy, Autosomal dominant polycystic kidney disease, Glomerocystic kidney disease

**Final Diagnosis:** Lithium tubulointerstitial nephropathy

**References:**


**Description:** Ultrasound (longitudinal section) of the right kidney/liver showing multiple hyperechoic foci within the right kidney (white arrows). **Origin:** Barts Health NHS Trust
Description: Ultrasound (longitudinal section) of the left kidney demonstrating hyperechoic foci within the left kidney (white arrows). Origin: Barts Health NHS Trust
Description: Coronal reformatted CT images of the chest, abdomen & pelvis. Hypodense microcysts demonstrated bilaterally (red arrows). Origin: Barts Health NHS Trust
Description: 5mm Axial CT images at the level of both kidneys. Hypodense cysts demonstrated within both kidneys (red arrows). Origin: Barts Health NHS Trust