Abstract 32  Fabrication of artificial kidney stones of different physical properties for ex vivo experimentation

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Introduction: There have been several new technologies introduced recently for lithotripsy. The optimal settings of these devices are unknown for different kidney stone densities. This study aims to develop artificial kidney stones for ex vivo studies.

Methods: BegoStone was prepared with a powder to water ratio (by weight) ranging from 15:3 to 15:6. The phantoms' acoustic properties were characterised by using an ultrasound transmission technique, from which the corresponding mechanical properties can be calculated based on elastic wave theory.

Results: The measured parameters for BegoStone phantoms of different water contents were assessed with regard to longitudinal wave speed, transverse wave speed, density, longitudinal acoustic impedance, transverse acoustic impedance, Young's modulus, bulk modulus, and shear modulus. Longitudinal (CL (m/s)) and transverse wave speeds (CT (m/s), and density (ρ (Kg/m³))) of BegoStone phantoms with different powder to water ratios corresponded to the known properties reported in natural kidney stones (Calcium Oxalate Monohydrate, Brushite, Uric acid and Struvite). A BegoStone water ratio of 15:3 had similar properties to Calcium Oxalate Monohydrate, 15:4 to be similar to Brushite, 15:5 was similar to Uric acid, and 15:6 was similar to Struvite.

Conclusion: This BegoStone preparation method can be used to fabricate artificial stones with physical properties matched with those of natural kidney stones of various chemical compositions.

Abstract 33  In vitro evaluation of optimal device settings for the Swiss Lithoclast Trilogy Lithotripter

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Introduction: The LithoClast Trilogy Lithotripter is the latest generation lithotripter. It has four modifiable settings for stone fragmentation - Impact (0–100%), frequency (0–12 Hz), ultrasound (0–100%) and suction (0–100%). The configuration for different stone types is unknown. We aim to determine the optimal settings for four stone types.

Methods: Calcium oxalate, calcium phosphate, uric acid and struvite 2cm³ phantoms were created using Begostone. Ultrasound and suction were kept constant at 100% and 40%. Impact and frequency were adjusted for a combination of 10 settings and repeated N = 3. Drill speed and fragment size were calculated using 34 mm.

Results: One hundred percent impact and frequency of 12 Hz resulted in the fastest clearance times of Struvite phantom stones, mean 83 seconds. For uric acid stone phantoms, impact of 30% and a frequency of 4 Hz was the fastest setting for stone clearance, mean 83 seconds. Calcium phosphate stone phantoms were treated fastest at an impact of 30% and frequency of 4 Hz (mean 217 seconds). The fastest clearance rate for calcium oxalate stone phantoms was at an impact of 30% and a frequency of 12 Hz (mean 204 seconds). Interestingly the slowest rate of calcium oxalate stone phantom clearance was an impact of 60% and 8 Hz (mean 269 seconds).

Conclusion: Stone clearance rates, drill speeds and average fragment sizes were calculated for the most commonly occurring stones using the Swiss Lithoclast Trilogy lithotripter. The results indicate that harder stone phantoms may fragment more efficiently at lower device settings.

Abstract 34  A cross sectional sample study of pregnancy and renal outcomes after renal transplant at the National Kidney Transplant Service

National Kidney Transplant Service (NKTS), Beaumont Hospital, Dublin

Introduction: Renal transplantation for end stage renal disease (ESRD) offers a significant improvement to quality of life and overall survival benefit. Women receive 40.6% of renal transplants at the NKTS. Given that fertility in women with ESRD is reduced by a factor of 10, renal transplantation also offers women of child bearing age an increase of fourfold in their fertility. Despite this, pregnancy rates in transplant recipients are lower than the general population.

Methods: A retrospective cross sectional sample study was performed of 41 women of childbearing age (18–49 years) who were reported to be planning for conception post renal transplantation. The centralised renal Electronic Patients Records (EPR) was used to collect details of successful pregnancies, pregnancy complications and renal function after pregnancy.

Results: Forty-one patients were identified who were planning pregnancy. Eighteen patients who never became pregnant, had been lost to follow up or had no documentation on the EPR were excluded. Thirty-six pregnancies were documented in 23 patients. Nine (25%) pregnancies ended in miscarriage. Eight (29%) full term pregnancies were complicated by pre-eclampsia. None of the women required dialysis during pregnancy. Five patients (21%) required a subsequent transplant after pregnancy. Mean time to repeat transplant after pregnancy was 4.4 years.

Conclusion: This sample provides an insight into pregnancy outcomes of women who received a renal transplant in Ireland. Miscarriages are slightly higher than the general population. Pre-eclampsia rates are higher than the general population. In those that went onto require further transplant, renal failure was not pregnancy related.

References

Abstract 35  The Paediatric Renal Transplant Recipient: A retrospective review of the changing trends of transplantation in Ireland

National Kidney Transplant Service (NKTS), Beaumont Hospital, Dublin

Introduction: Renal transplantation in the paediatric population for end stage renal disease (ESRD) offers a significant improvement to quality of life and overall survival benefit. Even with the current Covid-19 pandemic, 123 renal transplants were carried out in Ireland in 2020.

Methods: A retrospective analysis was performed of all paediatric transplant recipients (0–16 years old). The decades (eras) from 1969 to 2020 were then compared.

Results: There were 325 paediatric transplants performed, 35 (10%) were a 2nd transplant and 9 (3%) had a 3rd transplant during childhood.
Of these, 236 (72%) were deceased donors and 83 (25%) were living related donors (LRD). The most common cause of ESRD was congenital (28%) followed by chronic progressive nephropathy (23%). Overall graft survival was 85% at 1 year, 60% at 10 years and 35% at 20 years. On analysis by eras, the 5 year overall graft survival was 93% versus 45% for 2011–2020 (era 5) and 1969–1981 (era 1), respectively. The log-rank test for equality of graft failure showed a clinically significant reduction in overall graft failure in the most recent eras (485) (p < 0.0001). HLA mismatch was found to be an increased risk of graft failure (HR 1.22, 95% CI), while LRD transplants were found to reduce risk of graft failure (HR 0.6171, 95% CI).

**Conclusion:** Renal transplant graft survival has improved over time.

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**Abstract 36**

**COVID-19: The impact on urology in-patient length of stay in a single centre**

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**Introduction:** COVID-19 has significantly impacted all areas of healthcare including access to theatre, beds and imaging1. Risks to patients with COVID-19 who require surgery are well studied and reported2. We aimed to assess the impact of COVID-19 on length of stay for urology patients admitted with ureteric stones, haematuria and bladder cancer in Tallaght University Hospital.

**Methods:** HIPE data was acquired and analysed for two matched 10-month periods 01/04/2019–28/02/2020 (Pre-COVID) and 01/04/2020–28/02/2021 (COVID) for patients. The principle diagnoses assessed included ureteric calculi, haematuria and malignant neoplasm of the bladder. The length of stay (LoS) was compared for each patient group using Welch’s unpaired t-test. All statistical analysis was performed using GraphPad QuickCalcs. A p-value of < 0.05 was considered statistically significant.

**Results:** There were 414 urolithiasis admissions during the pre-COVID time period compared to 251 during the COVID period, the average LoS were 3.07 days, 3.24 days respectively (p = 0.6434). In the pre-COVID period, there were 57 admissions with unspecified haematuria, compared to 61 admissions during COVID, with an average LoS of 8.77 and 6.82 days respectively (p = 0.4475). 84 patients with bladder cancer were admitted pre-COVID compared to 57 admissions during COVID with an average LoS of 11.15 and 8.05 days respectively (p = 0.2727).

**Conclusion:** There was a significant reduction in in-patient admissions for both urolithiasis and bladders cancers during the COVID period compared to pre-COVID. The mean LoS of patients admitted with haematuria and malignant neoplasms of the bladder was reduced during the COVID period but not statistically significantly.

**References**


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**Abstract 37**

**Introduction of a haematuria clinic in a Model 4 hospital - Adapting models of care**

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**Introduction:** Visible haematuria (VH) is a common urological complaint that can be the first symptom of an underlying malignancy. Investigation of unexplained VH includes a CT Urogram and a cystoscopy. In January 2019 in Beaumont hospital, a nurse-lead haematuria clinic (HC) was instituted, allowing for triage of patients with VH. These patients were offered a CT Urogram and flexible cystoscopy, without first being seen in a consultant-led clinic. We aim to review the impact on pathways of care since the introduction of the HC.

**Methods:** We performed a retrospective cohort analysis, comparing patients referred in 2018 to 2019, the year before and after the introduction of the HC. Data analysed included dates and nature of referrals, investigations, diagnosis, treatments and discharges. Statistical analysis was performed using SPSS software with Pearson chi squared and Independent sample t-tests.

**Results:** In the first year of the HC, 175 patients were referred; 120 male, 55 female with an average age of 66 years old. 18 patients were excluded as they failed to attend their appointments. Time to completion of investigation decreased from over 150 to 58 days (2018:2019; p < 0.01). Discharge rate increased from 19% to 48% (2018:2019; p < 0.01). In the first year of the HC, 12 urinary tract malignancies were diagnosed including two small cell carcinomas and ten transition cell carcinomas. These patients had rigid cystoscopies an average of 70 days after referral.

**Conclusion:** Introduction of a haematuria clinic has reduced the workload on consultant-led clinics while reducing wait times to get fully investigated for urothelial malignancies.

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**Abstract 38**

**The natural history of untreated renal calculi**

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**Introduction:** Nephrolithiasis affects an estimated 8.8% of our population1. Many patients are managed conservatively, with an accepted 20% conversion to operative management in a 5-year period2. In the context of increasing waiting times, outpatient appointments are precious, and novel review pathways are required. Accurate Irish data on the natural history of renal calculi may inform the development of nephrolithiasis surveillance guidelines. We present our early review data on the natural history of untreated stones.

**Methods:** Some 538 patients were identified awaiting outpatient nephrolithiasis review. Patients attended for up-to-date x-ray, and were also sent a questionnaire regarding symptoms, stone passage, and interval intervention. Questionnaire and imaging were reviewed by a consultant and trainee urologist.

**Results:** One hundred patients both returned the questionnaire and underwent interval re-imaging. Mean age was 53.1 years. Time since last appointment ranged from 18 to 60 months. Forty-six patients remained asymptomatic. Of the 54 (54%) patients who reported symptoms, 48 (48%) reported flank pain, 15 (15%) reported haematuria, and 9 (9%) reported recurrent urinary infections.