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Abstract No. 324

Determination of optimal routine exchange frequency to minimize costs associated with long-term percutaneous nephrostomy (PCN) management for patients with malignant urinary obstruction

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Purpose: To determine the optimal time for routine exchange of indwelling percutaneous nephrostomies (PCNs) in patients with malignant urinary obstruction and to quantify the effect of patient adherence to scheduled exchanges.

Materials: We retrospectively reviewed patients with malignant urinary obstruction who underwent placement of PCN with at least one subsequent exchange from 2011-2013. Exchanges were classified as routine or due to one of three complication types: mechanical (tube dislodgement), obstruction, or infection. Charges for each complication type were defined as the median value from representative cases. The distribution of exchange types under different routine exchange frequencies was estimated with an Accelerated Failure Time Model and average yearly PCN-related hospital charges were estimated with a Markov Chain Monte Carlo model.

Results: 54 patients with 107 exchange encounters met criteria for inclusion. Median hospital charges were \$3.4k for routine exchanges, \$40.6k for infection, \$32.0k for obstruction, and \$5.6k for mechanical. The model predicted that with a 90-day routine exchange and 50% adherence, 23% of exchanges would be routine and 31% due to infection, which were projected to improve to 44% and 18%, respectively, with a 60-day routine exchange and 75% adherence. Estimated yearly PCN-related hospital charges were \$253k without mandated routine exchanges, and were lowest with 60-day routine exchanges (savings of \$23.4k ± \$1.1k with 75% adherence), with exchange at 30 days producing the second-most savings (\$21.0k ± \$1.8k) (Table). Projected savings increased with patient adherence, as projected savings with 60-day exchange were reduced to \$7.8k ± \$0.7k if adherence fell to 25%.

Conclusions: Scheduled routine PCN exchanges every 1-2 months is the least costly strategy for patients with malignant ureteral obstruction.

Annual reduction in charges per patient at various routine exchange intervals with 75% adherence.

Exchange Interval (days)	Savings (\$ thousands)	95% Confidence Interval (\$ thousands)
30	21.0	(19.2, 22.8)
60	23.4	(22.3, 24.5)
90	17.3	(15.6, 8.3)
120	7.8	(7.4, 8.3)

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Abstract No. 325

Safety and efficacy of 3% sodium tetradecyl sulfate foam sclerotherapy in the treatment of renal cysts in autosomal dominant polycystic kidney disease

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Purpose: Deterioration in renal function in the setting of Autosomal Dominant Polycystic Kidney Disease (ADPKD) is thought to be mediated by mass effect from cyst expansion within the kidney resulting in both ischemia and urinary obstruction at the nephron level. The purpose of this study was to evaluate the safety and efficacy of 3% Sodium Tetradecyl Sulfate (STS) foam sclerotherapy for renal cyst volume reduction in ADPKD patients.

Materials: A retrospective review of 67 ultrasound/fluoroscopy-guided foam sclerotherapy procedures in 36 patients with ADPKD was conducted. Safety and technical parameters were evaluated for the 67 procedures. Treatment response was evaluated for 58 cysts treated in 26 patients with pre- and post-sclerotherapy MR imaging. Large cysts (> 7cm) were treated with two-stage sclerotherapy, with 1 week between sessions. Medium sized cysts (4-7 cm) underwent single-session sclerotherapy. Pre- and post-sclerotherapy cyst volumes were measured with manual segmentation, and compared with a paired t-test (α = 0.05). Linear regression analysis was performed.

Results: Mean follow-up was 162 days (range: 47-338 days). Mean cyst volume was 214.7 ± 206.0 mL pre-, and 26.4 ± 43.0 post-sclerotherapy, with a mean cyst volume reduction of 84.2% (p < 0.0001). For single-session sclerotherapy, increased foam concentrations (3% STS: air) were predictive of improved percent reduction in cyst volume (β = 1.15, SE = 0.54, p < 0.0001). Mean fluoroscopy time was 1.63 minutes. Mean dose was 162.0 mGy and 468.9 cGy*cm². For the 67 procedures, 2 minor complications occurred, including a case of self-limited minor hematuria possibly related to the procedure, and a case of minimal superficial skin infection surrounding a drain site 1-week following the first stage of a two-stage sclerotherapy that resolved after a short-course of oral antibiotics. No major complications occurred.

Conclusions: 3% foam sclerotherapy is a safe and efficacious treatment for reducing individual cyst volume in patients with ADPKD. Foam dilution factor was predictive of treatment response for single-session sclerotherapy. Further studies are required to evaluate this technique's potential for preserving renal function in ADPKD patients.

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Abstract No. 326

MRI fused cone-beam CT-guided biopsy of the prostate as a safe and novel method of prostate biopsy

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Purpose: 3D fluoroscopy guidance using cone-beam CT (CBCT) can be fused to MRI images, allowing direct coaxial needle

placement into an MRI target using the real-time fluoroscopy. Our objective is to describe our initial experience using MRI fused CBCT guidance for prostate biopsy. To date, there are no reports on the use of this biopsy guidance system in the prostate. We hypothesize this technique will have an adequate safety profile while accurately detecting prostate cancer.

Materials: Patients were selected for this study if they had undergone a previously negative TRUSP biopsy or previous TRUSP biopsy showing low volume Gleason 6 pathology (low risk disease), all of which are incongruent with the assigned PI-RADS score (≥ 3) of an MRI lesion and/or the PSA level. All of our prostate biopsies were completed using MRI fused CBCT as a navigation system using a transluteal approach. Dedicated software (XperGuide, Philips Imaging) was used to plan the approach and confirm the location of the coaxial needle prior to biopsy. The immediate and 30-day complication rate and biopsy results were recorded.

Results: In total, 20 patients underwent CBCT-guided biopsy. The procedure was well tolerated with no immediate or 30 day complications. Thirteen of the 20 patients had previously received negative results from their TRUSP biopsy. Out of this cohort, CBCT-guided biopsy produced 7 positive biopsies. In 4 patients, the Gleason score was ≥ 7 . In the remaining 3 biopsies, a low volume Gleason score of 6 was established, also upgrading the disease. The remaining 7 patients had previous positive TRUSP biopsies that demonstrated low volume Gleason 6 disease. The CBCT-guided biopsy upgraded 1 patients' pathology to Gleason 7 disease and confirmed a second patients' Gleason 6 results. Four of the 11 PI-RADS 5 lesions were upgraded to Gleason ≥ 7 . The 2 PI-RADS 3 lesions did not demonstrate disease.

Conclusions: MRI-fused CBCT guidance is a technically feasible navigation system with no complications in our limited 20 biopsy experience. It has the potential to upstage disease in patients with high PI-RADS lesions on MRI.

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Abstract No. 327

A prospective randomized study of a covered metallic ureteral stent versus double J Stent for malignant ureteral obstruction: PRODUCE study (NCT01823575)

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Purpose: To assess the safety and efficacy of a covered metallic ureteral stent versus double J stent for the treatment of malignant ureteral obstruction.

Materials: Eighteen patients were randomized to fully silicone-covered metallic ureteral stent (group A) or double J stent (group B). The stent is 7-mm and 8-Fr in groups A and B, respectively. The followings were compared between the two groups; technical success (successful stent placement into desired locations), stent

malfunction, stent patency (no obstruction and no additional intervention), complications, and survival.

Results: Technical success was 100% in all nine and 12 renal units in groups A and B, respectively. During the mean follow-up period of 239.0 days (range, 63 — 572 d), stent malfunction was observed in 44.4% (4/9) and 66.7% (8/12) in groups A and B, respectively. The median patency rates for groups A and B were 239.0 days \pm 23.2 (95% confidence intervals [CIs]: 193.6 — 284.4) and 80 days \pm 23.2 (95% CIs: 34.6 — 125.4), respectively. Metallic ureteral stents yielded higher patency rates at 90- and 180 days (89% vs. 35% and 49% vs. 21%), despite no significant differences in overall patency rates between two groups ($P = .079$). Complications included migration of two metallic stents in one patient in group A, which were removed by retrograde manner, followed by double J stent insertion. The two groups did not differ significantly in overall survival rates ($P = .508$).

Conclusions: Metallic ureteral stents can be effective for malignant ureteral obstruction. A multicenter study with a greater patient cohort is warranted to further assess the outcomes after the application of metallic ureteral stents for malignant ureteral obstruction.

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Abstract No. 328

Outcomes after nephrostomy tube placement in pregnant patients with ureteral obstruction

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Purpose: To review the outcomes after nephrostomy tube placement in pregnant patients with ureteral obstruction.

Materials: A retrospective analysis of pregnant female patients undergoing nephrostomy tube placement during a 5-year period (2010-2015) was performed and outcomes from tube placement through delivery were assessed.

Results: Thirty patients (mean age = 26.6 years; range: 18-37) underwent nephrostomy tube placement during pregnancy; 25/30 were followed to delivery (4/30 continued their care closer to home; 1/30 is still pregnant). The mean gestational age at the time of tube placement was 25.4 weeks (range: 5-32 weeks). The etiology of obstruction included renal calculi ($n = 10$), pyelonephritis ($n = 7$), congenital or surgical abnormalities ($n = 2$), ovarian hyperstimulation syndrome ($n = 1$), and unknown ($n = 10$). 70% ($n = 21$) of patients required 2 or more tube changes during pregnancy; the mean number of tube changes during pregnancy was 4.6. Unscheduled tube changes due to decreased urine output were performed in 11 patients at a mean of 21.5 days after tube placement. This prompted 10 patients to undergo tube changes at 1-2 week intervals until delivery. 36.7% ($n = 11$) of patients required general or MAC anesthesia for the tube placement or change. The mean gestational age at delivery was 37.7 weeks (range 29-40 weeks) with 3 premature births recorded (12%). Caesarean section was performed in 14 of 25 (56%) patients.

Conclusions: While symptomatic ureteral obstruction during pregnancy is uncommon, its management in this patient population can be challenging. This retrospective review demonstrates that the changes in urine chemistry during pregnancy can lead to short-term nephrostomy tube obstruction, requiring