What's inside

CAN ARTIFICIAL INTELLIGENCE AID THE UROLOGIST IN DETECTING BLADDER CANCER?

A systematic review on the role of artificial intelligence (AI) in detecting bladder cancer by Hengky *et al.* features in this edition.[1] The review includes prospective, retrospective, experimental, cross-sectional, and case–control studies, and 5 studies were included in the final analysis. All the studies included used histology after transurethral resection of bladder tumor as the standard against which predictions of cystoscopy are compared. The authors report a pooled sensitivity and specificity of 0.953 (95% confidence interval [CI]: 0.908–0.976) and 0.957 (95% CI: 0.923–0.977), respectively. A subgroup analysis which excluded the blue-light cystoscopy showed a higher diagnostic accuracy. Although AI-assisted cystoscopy has high diagnostic accuracy, its clinical utility remains questionable as there is lot of heterogeneity and possible biases in literature at present. How the AI algorithms will perform during a live cystoscopy remains unanswered as of now. Focused research on high-risk populations may lead to better outcomes.

FACTORS INFLUENCING URINARY RETENTION FOLLOWING FREEHAND TRANSPERINEAL PROSTATE BIOPSY: INSIGHTS FROM A TERTIARY CARE CENTER STUDY

Agrawal *et al.* report the risk factors for urinary retention after freehand transperineal prostate biopsy.[2] A dataset of 102 patients who had been subjected to a freehand transperineal prostate biopsy was retrospectively evaluated. A multiparametric magnetic resonance imaging (mpMRI) prostate was performed in all patients, and a cognitive fusion biopsy using the transperineal route was performed. Twenty systematic cores with additional target cores were obtained; the prostate was visualized using a transrectal ultrasound with a BK 5000 machine and a biplanar probe. Of the 102 patients, 14 patients (13.72%) experienced retention of urine; all the patients were catheterized and voided after a catheter-free trial. The authors report that the patients with larger-sized prostate with a cutoff of 57.5 cc were at a higher risk of retention of urine. Increase in the number of cores, i.e., >23 also put the patients at a significant risk of retention with a sensitivity and specificity of 85.71% and 82.95%, respectively. The patients' age, prebiopsy prostate-specific antigen (PSA), and use of alpha-blockers did not impact retention, but patients with preexisting lower urinary tract symptoms had a higher incidence of retention though this did not reach statistical significance. The authors conclude that patients with larger prostates should be counseled about urinary retention, and due diligence in getting targeted cores should be done to prevent the same.

THE REUSED–DISPOSABLE SCOPE IN FLEXIBLE URETEROSCOPY FOR STONES AS A COST-CONSCIOUS APPROACH: REPORTING THE OUTCOMES OF A REAL-WORLD PRACTICE MULTICENTER STUDY OF 2183 PATIENTS BY THE TEAM OF WORLDWIDE ENDOUROLOGICAL RESEARCHERS' GROUP

Gauhar *et al.* in this article have touched on a controversial yet very important topic of the reuse of single-use flexible ureteroscopes.[3] Retrospective analysis of 2183 cases of upper ureteric and renal stone in whom flexible ureteroscopy was done at 11 different centers across the globe were evaluated. The authors found that 88% of the times, the scope was used only for the second time, and 12% of the times, it was used between 3 and 5 times. The surgeons experienced a scope malfunction in 3.9% of cases and had to change the scope. This cost-conscious approach of reusing single-use flexible ureteroscopes did not lead to an increased risk of infections in the study set of patients. The authors do not recommend the reuse of single-use flexible ureteroscopes as the standard of care, but surely, it is time to look into this aspect and doing a prospective analysis with detailed cost analysis as the way forward.

PERFORMANCE AND CLINICAL IMPLICATIONS OF VESICAL IMAGING REPORTING AND DATA SYSTEM IN DETECTING MUSCLE INVASION IN BLADDER TUMORS: A PROSPECTIVE, OBSERVATIONAL STUDY

Reddy *et al.* report the outcomes Vesical Imaging Reporting and Data System (VIRADS) scoring system and its ability to differentiate T1 and T2 lesions in 33 patients.[4] The role of biparametric MRI was also studied in these patients. Treatment-naïve patients with cancer bladder were included in the study. All the patients were subjected to a multiparametric MRI, and two experienced uroradiologists reported that the MRIs and the discrepancies were resolved using mutual consensus. The reports were correlated with the final histology to conclude the accuracy of reporting. All the morphological types of bladder cancer, sessile and pedunculated, were included. 54.55% of patients (18/33) had a muscle-invasive disease on final histology. The number of patients having a VIRAD score of 4 and 5 were 10 (30.3%) and 8 (24.4%), respectively. With a VIRAD score of >4, the mpMRI had a high sensitivity and specificity for detecting muscle invasion. This study with a limited sample size supports the use of mpMRI for bladder cancer, helping the clinician differentiate between a muscle-invasive and nonmuscle-invasive disease.

CREATION AND EVALUATION OF A THREE-DIMENSIONAL PRINTED SYNTHETIC VAS DEFERENS FOR MICROSURGICAL TRAINING

Vasectomy reversal is a procedure that is relatively infrequently performed, yet it is an important procedure in the armamentarium of an andrologist/microsurgeon. It is difficult to train in this surgery as the caseload is low at even high-volume centers. To overcome this challenge, Joshi *et al.* present a three-dimensional (3D) printed model of vas difference for microsurgical training.[5]

The outer diameter of the model is 1 mm, and the inner diameter is 0.5 mm. The model was made from thermoplastic polyurethane filament, and a foaming agent was added to maintain the stiffness of the model at variable temperatures. The model was sent to 5 fellowship-trained microsurgeons; all surgeons were able to use 9-0 and 10-0 sutures on the model. Eighty percent of the surgeons could complete the anastomosis, and most of them found it suitable for a single-layer anastomosis. The participants felt that the model could be more softer and flexible but was a valuable training tool. The authors conclude that the 3D printed vas deferens model is a cheap and easily available tool for vasal microsurgical training.

THE USE OF AMNIOTIC MEMBRANE INJECTION AS AN ADJUNCT IN ENDOSCOPIC URETHRAL STRICTURE MANAGEMENT

Endoscopic treatment of urethral stricture has a high rate of failure. To overcome this, Pryde *et al*. present use of micronized amniotic membrane injection at the stricture site.[6] The authors conducted a prospective, single-center study and included anterior urethral strictures with <12fr lumen size and <1.5 cm in length. The success was measured at the end of 6 months or as soon as the symptoms developed. Although the antiscarring and anti-inflammatory properties of amniotic membrane are well established, in this study, it was not found to be of benefit when compared to urethral dilatation alone at the end of 6 months.

ARTIFICIAL INTELLIGENCE IN PROSTATE CANCER: THE POTENTIAL OF MACHINE LEARNING MODELS AND NEURAL NETWORKS TO PREDICT BIOCHEMICAL RECURRENCE AFTER ROBOT-ASSISTED RADICAL PROSTATECTOMY

In another attempt to harness the potential of AI, Singh *et al.* have compared the utility of machine learning (ML) and neural networks (NNs) with the traditional statistical methods for predicting biochemical recurrence (BCR) postrobotic radical prostatectomy.[7] The study used radical basis function NN (RBFNN) and two ML approaches (K-nearest neighbor and XGBoost) to estimate BCR. Of the 516 men who were included in the study, 234 (45.3%) patients developed BCR. The median follow-up of the patients was 24 (15–42) months, and the median time to BCR was 12.23 ± 15.58 months. For both the ML models and radial basis function NN, the data were split into two: 30% for training and 70% for testing the algorithms. Parameters used for training and testing were preoperative serum PSA, preoperative MRI, pathological grade and stage, total tumor volume quantification in the final Histopathology report (HPR), Lymph node (LN) yield and positivity, and margin positivity. The XGBoost ML improved the ability to detect BCR by 6.5% over the conventional methods; the area under the curve for RBFNN was 0.82 which again was significantly more as compared to the conventional methods. The authors conclude that RBFNN and XGBoost outperformed the conventional statistical methods in predicting BCR.

PREOPERATIVE PROSTATE MAGNETIC RESONANCE IMAGING DOES NOT IMPACT SURGICAL OUTCOMES OF RADICAL PROSTATECTOMY

Preoperative MRI is a quintessential part of diagnosis and staging for cancer prostate. Bozorgmehr *et al.* try to define the role of mpMRI in predicting the outcomes of radical prostatectomy.[8] In a retrospective, propensity-matched analysis, 285 patients who had been subjected to mpMRI prostate preoperatively were matched to 285 patients who did not have a preoperative mpMRI of 1044 patients who were treated during 2012–2017. A multivariable analysis was performed, and no significant difference was found in operative time, estimated blood loss, positive surgical margin, lymph node yield, rate of complication within 30 days, and positive surgical margin between the two groups. The complications increased with increase in the comorbidities, the predictor for operative time was body mass index, the Gleason score predicted the lymph node yield, and increasing PSA levels correlated with margin positivity.

Contrary to the common belief, the authors conclude that a preoperative mpMRI did not impact the perioperative outcomes after radical prostatectomy in a matched pair analysis.

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