**PD01-06**

**NOVEL INTRAOPERATIVE NAVIGATION USING ULTRA-HIGH-RESOLUTION CT IN ROBOT-ASSISTED PARTIAL NEPHRECTOMY**

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**INTRODUCTION AND OBJECTIVE:** Successful surgery in robot-assisted partial nephrectomy (RAPN), especially for highly complex tumors, relies on a detailed understanding of the anatomical relations of the tumor absolute and relative to the urinary tract and the vascular structures, including the renal pedicle. Intraoperative navigation with accurate information regarding tumor position relative to the surrounding urinary vascular structures undoubtedly assists the surgeon during RAPN.

**METHODS:** We retrospectively analyzed 323 patients who underwent RAPN using an ultra-high-resolution computed tomography (UHR-CT) scanner or area-detector CT (ADCT) to assess the perioperative and short-term functional outcomes of RAPN with intraoperative navigation using a UHR-CT scanner. Perioperative outcomes and the postoperative preservation ratio of estimated glomerular filtration rate (eGFR) were compared.

**RESULTS:** After the propensity score matching, we evaluated 99 patients in each group. Although the median warm ischemia time (WIT) was less than 25 min in both groups, it was significantly shorter in the UHR-CT group than in the ADCT group (15 min vs. 17 min, \(p = 0.032\)). Moreover, the estimated blood loss (EBL) was significantly lower in the UHR-CT group than in the ADCT group (33 mL vs. 50 mL, \(p = 0.028\)). However, there were no significant intergroup differences in the postoperative preservation ratio of eGFR at 3 or 6 months of follow-up (ADCT 91.8% vs. UHR-CT 93.5%, \(p = 0.195\); and ADCT 91.7% vs. UHR-CT 94.0%, \(p = 0.160\), respectively).

**CONCLUSIONS:** Although no differences in short-term renal function were observed in intraoperative navigation for RAPN in this propensity score–matched cohort, this study is the first to demonstrate that UHR-CT resulted in a shorter WIT and lower EBL than ADCT.

**Source of Funding:** None

**PD01-07**

**3D MODELS FOR SURGERY PLANNING IN RENAL CELL CARCINOMA WITH VENOUS THROMBUS EXTENSION. PHASE II NCT03738488: PREDICTIBILITY**

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**INTRODUCTION AND OBJECTIVE:** Renal cell carcinoma (RCC) with venous thrombus extension (VTE) represents a great therapeutic challenge, being essential an adequate pre-surgery planning to make surgery more predictable. 3D models are printed copies of patients’ radiological images that enhance anatomy understanding and may improve surgical planning. Our aim is to determine if surgery planning based on 3D models in comparison with the conventional surgery planning, allows a more predictable surgery.

**METHODS:** Multicenter clinical trial on 66 patients diagnosed with RCC and TTV who underwent a nephrectomy with thrombectomy. Patients were randomized 1:1 to the 2 study groups: 1) surgery planning with conventional images; 2) surgery planning with 3D models. Each urologist answered a questionnaire before and after the surgery and a Kappa index was used to measure the agreement between surgery planning and the surgery itself in the two study groups.

**RESULTS:** See Table.

**CONCLUSIONS:** Surgery planning with 3D models was more predictive than surgery planning with conventional images in RCC with VTE.
**Agreement grade between surgery planning and surgery (Kappa index)**

| Surgical technique       | 3D Images | Kappa Index | Interpretation | Kappa Index | Interpretation |
|--------------------------|-----------|-------------|----------------|-------------|----------------|
| Thrombectomy             | 1,0       | Perfect agreement | 0,2   | Fair agreement |
| Reconstruction           | 1,0       | Perfect agreement | 0,7   | Substantial agreement |
| Vascular control         | 1,0       | Perfect agreement | 0,4   | Fair agreement |

**General surgeon**
- 1,0 Perfect agreement
- 1,0 Almost perfect agreement
- 1,0 Perfect agreement

**Vascular surgeon**
- 0,9 Moderate agreement
- 0,9 Fair agreement
- 1,0 Perfect agreement

**Cardiac surgeon**
- 0,9 Moderate agreement
- 0,9 Fair agreement
- 1,0 Perfect agreement

**Human resources**
- 1,0 Almost perfect agreement
- 1,0 Almost perfect agreement
- 1,0 Perfect agreement

**Pre-surgery procedures**
- 1,0 Perfect agreement
- 1,0 Perfect agreement
- 1,0 Perfect agreement

**Table 2: Cost Data of Senhance and Davinci radical prostatectomy (USD)**

|                       | Total supply cost (mean) | Total supply cost (median) | Total cost for robotic instruments (Mean) | Total cost for robotic instruments (Median) |
|-----------------------|--------------------------|----------------------------|-----------------------------------------|------------------------------------------|
| Senhance              | 4298.7[900.0]            | 4169.7[941.7-4551.6]       | 2417.4[952.5]                          | 2040.6[2333.5-2481.7]                    |
| Davinci               | 6753.5[902.0]            | 7499.7[961.1-8057.9]       | 5064.2[964.9]                          | 5066.4[4718.0-5221.0]                    |

**Source of Funding:** Pfizer

**PD01-08**

**COMPARISON OF SENHANCE ROBOT-ASSISTED RADICAL PROSTATECTOMY AND DA VINCI ROBOT-ASSISTED RADICAL PROSTATECTOMY: LEARNING CURVE, COST ANALYSIS AND SHORT-TERM SURGICAL OUTCOMES**

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**INTRODUCTION AND OBJECTIVE:** The Senhance® robotic system (Asensus Surgical Inc, USA) is a new laparoscopy-based robotic platform which has been increasingly used. Currently, there are limited papers discussing the application of Senhance radical prostatectomy (SRP). Here, we compared the SRP learning curve, short-term surgical outcomes and cost analysis with the da Vinci RP (DRP) cases.

**METHODS:** From Aug 2019 to April 2022, 65 cases of SRP were performed in National Taiwan University Hospital Yunlin branch. We compared peri-operative data with a prospectively collected 60 cases DRP cohort and a retrospectively collected cohort of initial 60 DRP cases enrolled from the National Taiwan University Hospital. Inclusion criteria was patients with biopsy confirmed prostate cancer, American Association of Anesthesiologists Score ≤ 3 and without evidence of metastasis.

**RESULTS:** The operative and pathological outcomes of the three cohorts are shown in Table 1. The SRP showed non-inferior results in positive margin rate, blood loss and operative time (OT) than the DRP. We used simple OT to analyze the learning curve. Figure 1-A, 1-B and 1-C represents the OT of experienced LRP-SRP surgeon, LRP-naive SRP surgeons and DRP surgeon respectively. The OT curve showed a much quicker downward trend in the experienced LRP-SRP and DRP surgeons than LRP-naive SRP surgeons. Median cost for each SRP in our hospital was $4170, which was lower than $7675 in the DRP.

**CONCLUSIONS:** Safety and short-term outcomes are comparable between SRP and DRP. For experienced laparoscopic RP surgeon, using Senhance system to perform RP is rather straightforward. With a more affordable price as its biggest advantage, Senhance system may serve as a safe and effective alternative for robotic RP.

**Source of Funding:** Pfizer

**PD01-09**

**A TRANSFORMER-AUGMENTED DEEP LEARNING ALGORITHM, CYSTONET-T, FOR IMPROVED CYSTOSCOPIC BLADDER CANCER DETECTION**

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**INTRODUCTION AND OBJECTIVE:** Adequate tumor detection is critical in cystoscopy for bladder cancer (BCa) diagnosis, risk stratification and treatment. The adoption of adjunct imaging technologies remains modest. Previously, we developed a deep learning algorithm, CystoNet, that holds the potential to improve performance of white-light cystoscopy (WLC) in a non-invasive and cost-effective manner. Herein we report CystoNet-T which incorporates a transformer-augmented deep learning algorithm to further improve detection of BCa on WLC.

**METHODS:** CystoNet-T was developed with a transformer-augmented pyramidal convolutional neural network architecture to improve automated BCa detection during WLC. A training set consisting of 510 tumor-containing frames (54 patients) and a test set of 101 tumor-containing frames (13 patients) were used. Training and test datasets were annotated by a urologist and pathologically confirmed to be BCa. Recall and precision were determined using intersection-over-union as the metric of interest. Harmonic precision-recall mean (F1 score) and average precision (AP) were determined. Performance was then compared against other benchmarks algorithms using the same training and test sets.

**RESULTS:** CystoNet-T detected BCa with a recall of 97.3%, precision of 95.6%, F1 of 96.4% and AP of 91.4% (Figure 1),