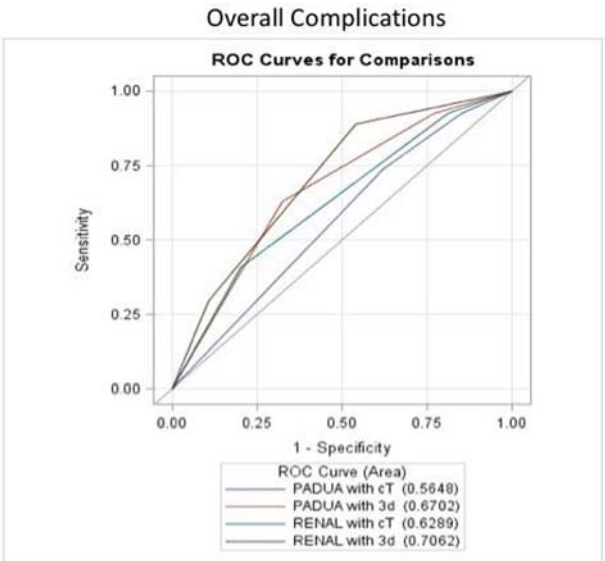
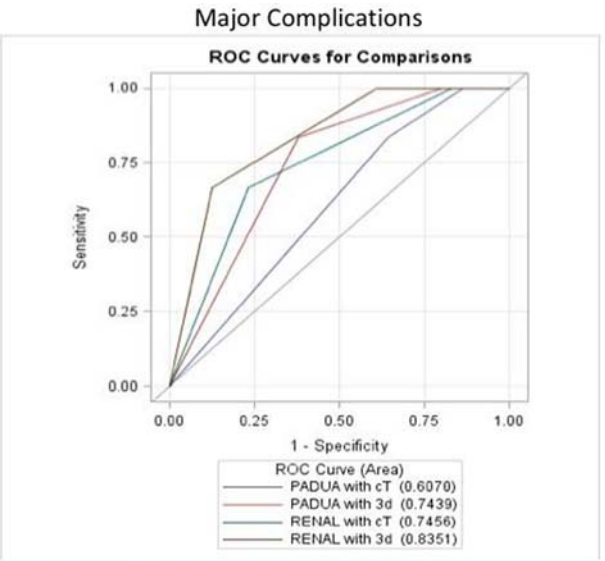


ROC Contrast Estimation and Testing Results by Row

Contrast	Estimate	Standard Error	95% Wald Confidence Limits		Chi-Square	Pr > ChiSq
PADUA with 3d - PADUA with cT	0,1054	0,0342	0,0383	0,1724	9,492	0,0021
RENAL with 3d - RENAL with cT	0,0773	0,0347	0,00927	0,1454	4,9588	0,026



ROC Contrast Estimation and Testing Results by Row

Contrast	Estimate	Standard Error	95% Wald Confidence Limits		Chi-Square	Pr > ChiSq
PADUA with 3d - PADUA with cT	0,1368	0,0231	0,0916	0,1821	35,1298	<.0001
RENAL with 3d - RENAL with cT	0,0895	0,0283	0,0339	0,145	9,9689	0,0016

Figure: (abstract: SC47).

distribution on the basis of the imaging tool (3DVMs and 2D imaging) used to assess the NS/NC, Cohen's k coefficient the concordance between classifications. ROC curves have been produced to evaluate sensitivity and specificity of the 3D-NS/NC vs 2D-NS/NC in predicting the occurrence of postoperative complications. General linear model was used to perform multivariable analyses, looking for predictors of overall postoperative complications.

Results: 101 patients were included in the study. The evaluation of PADUA and RENAL score via 3DVMs showed a downgrading in comparison with the same scores evaluated with 2D imaging in 48.5% and 52.4% of the cases. Similar results were obtained for NC (29.7% and 30.7% for PADUA risk and RENAL complexity categories). 3D-NS/NC demonstrated better accuracy than 2D-NS/NC in predicting overall and major postoperative complications (differences in AUCs for each NC reaching statistical significance comparing 3DVMs vs 2D imaging assessment, as shown in Fig. 1). Multivariable analyses confirmed the 3D-PADUA/RENAL NC as the only independent predictor of postoperative complications ($p = 0.019$; $p = 0.003$).

Discussion: In the present study, we demonstrated that 3DVMs are more precise than 2D imaging in assessing the renal masses surgical complexity via NS/NC, due to a better perception of tumor depth and its relationships with intrarenal structures, as confirmed by the higher accuracy in predicting postoperative complications.

SC48 3D Virtual models of kidney vascular anatomy: Is there a difference in arterial polar supply?

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Aim of the study: In the planning of partial nephron sparing surgery (NSS) the awareness of arterial segmental branches contribution to the different regions of the kidney has to be considered. Historically four anteropolar regions, fed by the segmental arteries originating from the prepyelic branch, and one posterior region, fed by the retropyelic branch, were described. According to this anatomical principle, the kidney poles are vascularized from a single segmental artery; thus, in case of closure/suture of this single artery during NSS for polar renal tumors, the whole pole is functionally lost. Nowadays, to better evaluate the vascular anatomy of the kidney and the spatial distribution of the segmental arteries in the parenchyma, 3D virtual reconstruction from contrast-enhanced computed tomography (CT) images is being developing. Aim of the study is to evaluate, with the aid of 3D virtual models (3DVMs) of kidneys and their vasculature, if an arterial supply to the polar regions is warranted also in case of prepyelic branch occlusion.

Materials and methods: From 08/2016 to 08/2018 all the patients suitable for PN with a preoperative contrast-enhanced CT were considered in the present study. Before surgery a bio-engineer processed CT-images in DICOM format in order to perform 3DVMs. With the aim to assess the vascular supply of the polar regions of the kidneys, a dedicated urologist reviewed all the 3DVMs evaluating if a contribution from both the prepyelic and retropyelic branches was present or not. Moreover, also the tumor characteristics, expressed with the PADUA score, were considered.

Results: 81 patients were considered for this study. Median PADUA score of the tumors was 10 (IQR 8:11), with a mean c-size of 47 mm (+18.6). 39/81 (48.1%) were polar located, 37/81 (45.6%) partially endophytic and 11/81 (13.5%) totally endophytic. Focusing on the polar vascular supply, in 48/78 (61.5%) cases the upper pole was fed by two symmetric arteries (from the pre and retropyelic branches respectively) with one single artery feeding the lower pole. A double pre and retropyelic vascularization of the lower pole with a single vessel of the upper pole was found in 11/78 cases only (14.1%). The remaining cases did not respect the double-single polar configuration, having a single vessel and a double vessel for each pole in 15.3% (12/78) and in 3.8% (3/78), respectively. In 7/81 cases the evaluation of the polar segmental vessels was impossible for a suboptimal quality of the CT enhanced phase or in case of big polar tumors subverting the normal kidney anatomy.

Discussion: The evidences found thanks to the 3DVMs evaluation demonstrate that, in more than 50% of the cases, the upper pole arterial supply is warranted by a double arterial system. This information should be considered before NSS when a polar tumor has to be treated, because the upper pole seems to be anatomically advantaged to save functional units than the lower.

SC49 The impact of hyperaccuracy 3D reconstruction and urologists™ perception for robotic partial nephrectomy indication in highly complex renal tumor

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Aim of the study: With the introduction of robotic technology, the indications to partial nephrectomy (PN) for complex renal masses have been expanded for both novice and expert surgeons. The indication to PN has been traditionally based on the standard bidimensional cross-sectional computed tomography (CT). A detailed case-specific understanding of the surgical anatomy represents a key point in the treatment planning of an higly complex renal mass. In this setting, the use of novel tools based on 3D reconstruction of kidney and its lesion could enlarge the indications to nephron sparing surgery. In this study, our aim was to assess 3D reconstruction role in aiding the surgeon in preoperatory planning for highly complex renal tumors amenable to robotic partial nephrectomy (RPN).
Materials and methods: During the 6th Techno-Urology Meeting (www.technourologymeeting.com) 20 highly complex renal tumors, already undergone robotic partial nephrectomy (RAPN) performed by an expert single surgeon, were made available for display to the attendees/urologists. Partecipants were asked to watch the videos of the CT scans first, and then the respective 3D reconstructions of 5 of the 20 cases who were randomly selected. After they watched the videos, physicians were asked to fill a purpose-built questionnaire with indication to radical vs partial nephrectomy on the basis of their own experience.
Results: 108 participants (20 expert urologists, 27 young urologists, and 61 residents) agreed to participate in the study, and a total of 542 views of the cases were obtained. On the basis of CT scan images alone, RPN was indicated in 256 cases (47.2%). After viewing 3D reconstruction, in 148 cases surgeons changed their indications raising RPN to 404 cases (74.5%) ($p < 0.001$). Univariable regression analysis did not found the responder's experience as significantly impacting in changing the surgical indication for the displayed cases ($P > 050$).
Discussion: This study represents a significant step towards the validation of the use of 3D reconstruction for surgical planning in patients undergoing robotic kidney surgery. The use of this technology might translate into a larger adoption of nephron-sparing approach even in case of highly complex renal masses.Further investigations in this area are needed to confirm these results.

SC50 Renal artery embolization before radical nephrectomy for complex renal tumor: Which are the true advantages?

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Aim of the study: Renal artery embolization is performed before RN for renal mass in order to induce preoperative infarction and to facilitate surgical intervention through decrease of intraoperative bleeding. Moreover, in metastatic renal cancer it seems to stimulate tumor-specific antibodies, even if no established benefits in clinical response or survival have been reported. The role of Preoperative Renal Artery Embolization (PRAE) in management of renal masses have been often debated and its real benefits are still unclear. Nevertheless, in huge and complex renal masses, that are often characterized by a high and anarchic blood supply and rapid local invasion, radical nephrectomy (RN) become challenge even for skilled surgeons. The aim of this prospective randomized study was to evaluate the effectiveness and safety of PRAE in complex masses comparing perioperative outcomes of RN with and without PRAE.
Materials and methods: From December 2015 to May 2018 we enrolled prospectively patients underwent RN for localized (T2a-b) or locally advanced (T3 and T4) or advanced (N+, M+) renal cancers. Patients were randomly assigned to two groups according to a simple randomization by computer-generated random numbers. The first included patients underwent PRAE; in the second group we enrolled patients who did not undergo PRAE. RENAL nephrometry score was used to quantify the tumor's relevant anatomical features as they related to the complexity of the mass, aiding the treatment decision-making. T2 tumors with Nephrometry Scores of 10–12 were considered high complexity and were included in the study. Other inclusion criteria were locally advanced (T3 and T4) or advanced (N+, M+) renal cancers. Exclusion criteria were T1 masses and bilateral or multi-focal tumors. Perioperative outcomes including operative time, blood loss, transfusion rate and length of hospitalization were evaluated. Statistical analysis was performed using GraphPad Prism 6.0 software.
Results: 64 patients were enrolled: 30 were included in Group 1 and 34 in Group 2. Median blood loss was 250 ml (50–500) and 400 ml (50–1000) in the first and second group, respectively, with a statistically significant difference ($p = 0.0066$). Median surgical time was 200 min (90–390) and 240 min (130–390) in PRAE and NoPRAE group ($p = 0.06$), respectively. No major complications occurred after embolization. Overall complication rate in Group 1 and 2 was 46.7% (14/30) and 50% (17/34), respectively ($p = 0.34$). No major complications occurred in both groups. The mean follow up was 21,5 months.
Discussion: Our results proves PRAE to be a safe procedure with low complications rate. To our experience, PRAE seems to be an useful tool in surgical treatment of huge mass and advanced disease because it consents a safer and easier management of renal artery.

SC51 Sutureless/Clampless vs Clamp/Suture technique in nephron sparing surgery for renal cancer. A comparison of safety outcome and postoperative renal function

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Aim of the study: The latest European guidelines recognize the safety of the off-clamp technique for nephrom sparing surgery. However, the debate on the risk of postoperative bleeding in patients who underwent a to a clampless and suturless technique is still open, as the debate on the reduction of postoperative renal function in patients who underwent to a clamp/sutures procedure. Aim of our study is to investigate safety outcomes in terms of blood loss and functional outcome (in terms of renal function) in patients treated with Clampless/Sutureless vs Clamp/Suture nephron sparing surgery.
Materials and methods: We retrospectively evaluated, from January 2013 to August 2017, 140 patients undergoing consecutive nephron sparing surgery. All the procedure has been performed by an expert surgeon (SV). After excluding patients with diagnosis of chronic renal failure, we have selected 119 patients and subdivided them in two groups, on basis of the technique performed (Group 1:Sutureless/