P085 Use of 3D printed segmented collapsible PCS models to improve the learning curve of residents

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Introduction & Objectives: Three-dimensional printing based on patient data allows physicians to create models for adequate visualization of kidney's structures. The purpose of this study is to define the usefulness of non-biological collapsible colour segmented 3D printing model of the renal pelvicalyceal system (PCS) in developing the understanding of its anatomy and decision the best way to perform PCNL by the residents.

Materials & Methods: A questionnaire was developed to assess the effectiveness of 3D models both in training and predicting PCNL, which 10 residents answered to (group 1). The questions were as follows: 1- the number of anterior calyces of the upper group, 2 - the number of posterior calyces of the upper group, 3 - the number of anterior calyces of the middle group, 4 - the number of posterior calyces of the middle group, 5 - the number of anterior calyces of the lower group, 6 - the number of posterior calyces of the bottom groups, 7 - the optimal calyx for the main access.

Results: In the first group, the determination of the anterior and posterior calyces of the upper group was worse by 54% ($p<0.001$) and 44%($p<0.001$), the difference in the determination of the calyces of the middle group was 54 %($p<0.001$) and 34%($p<0.001$), the answers regarding the number of anterior and posterior calyces of the lower group were worse by 48($p<0.001$) and 56%($p<0.001$), respectively. Similarly, there were worse answers for questions regarding the choice of access calyx. Thus, the ability to choose the optimal calyx for the main access was worse by 70%($p<0.001$), and for the second access by 72%($p<0.001$), respectively. A different situation was observed after examining the 3D models by the residents and re-comparison their answers with the answers of the doctors. The definition of the anterior and posterior calyces of the upper group was worse by 10% ($p = 0.23$) and 8% ($p = 0.31$), the middle group by 8% ($p = 0.2$) and 0% ($p = 1$), the lower group on 6% ($p = 0.4$) and 10% ($p = 0.1$), respectively. The choice of calyx for the main access differed by 12% ($p = 0.5$) and 20% ($p = 0.009$), respectively.

Conclusions: Collapsible 3D models of kidney's PCS are promising for training young professionals and planning PNL. The study of the anatomy of a single group of calyces, as well as the entire renal pelvicalyceal system makes possible to choose the optimal calyx for percutaneous puncture in PNL.