VIDEO SECTION

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Two-part silicone mold. A new tool for flexible ureteroscopy surgical training

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ABSTRACT

Introduction and objectives: Flexible ureteroscopy is a common procedure nowadays. Most of the training programs use virtual reality simulators. The aim of this study was to standardize the building of a three-dimensional silicone mold (cavity) of the collecting system, on the basis of polyester resin endocasts, which can be used in surgical training programs.
Materials and Methods: A yellow polyester resin was injected into the ureter to fill the collecting system of 24 cadaveric fresh human kidneys. After setting off the resin, the kidneys were immersed in hydrochloric acid until total corrosion of the organic matter was achieved and the collecting system endocasts obtained. The endocasts were used to prepare white color two-part silicone molds, which after endocasts withdrawn, enabled a ureteroscope insertion into the collecting system molds (cavities). Also, the minor calices were painted with different colors in order to map the access to the different caliceal groups. The cost of the materials used in the molds is $30.00 and two days are needed to build them.
Results: Flexible ureteroscope could be inserted into all molds and the entire collecting system could be examined. Since some anatomical features, as infundular length, acute angle, and perpendicular minor calices may difficult the access to some minor calices, especially in the lower caliceal group, surgical training in models leads to better surgical results.
Conclusions: The two-part silicone mold is feasible, cheap and allows its use for flexible ureteroscopy surgical training.

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CONFLICT OF INTEREST

None declared.

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EDITORIAL COMMENT

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EDITORIAL COMMENT: TWO-PART SILICONE MOLD. A NEW TOOL FOR FLEXIBLE URETEROSCOPY SURGICAL TRAINING

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The traditional surgical training model relies on an apprentice style learning where junior doctors are gradually turned into independent surgeons through a process of observation, assisted operating, supervised operating and finally independent operating (1). All of this takes place in the operating room, with real patients and requires a senior 'supervisor'. Limits on working hours and various other clinical and academic requirements limit operating time for junior staff. Availability of senior clinicians as teachers is also under threat as senior staff face increased patient loads and pressure by health systems to move towards consultant led care. This has led to considerable interest by surgeons in 'model' based learning over the past 20 years, especially as technology has progressed and minimally invasive techniques have become more numerous (2, 3). The main question is does surgical simulation transfer to skill in the operating room (3)? In urology this indeed appears to be true (4). This 2 part silicone mold presented in this video by Marroig et al. (5) appears to be a cheap, cost effective, efficient and ethical way for junior staff to familiarise themselves with flexible ureteroscopy. This model would offer a cheaper alternative to current 'high fidelity' ureteroscopy simulation trainers. More cost effective benchtop models have been shown to be just as useful as more expensive models (6), however the benefit of realistic model based trainers compared with cheaper computer based trainers has been questioned by some (4). The benefit of using simulation of any kind however is threefold; to the junior doctor who is able to have multiple attempts and opportunity for trial and error learning, to the hospital/senior clinician who has more efficient operating time and finally to patients whose operating time and complications may be reduced (3, 4).

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