

LESS, NOTES procedures nearing clinical feasibility

Surgeons are mastering the skill sets; technology still lags behind

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Cleveland—Laparo-endoscopic single-site surgery (*LESS*) and natural orifice transluminal endoscopic surgery (*NOTES*) for urologic procedures are moving “from talk to reality,” according to Inderbir S. Gill, MD, professor, chairman, and executive director, Institute of Urology, Keck School of Medicine at the University of Southern California, Los Angeles.

“Technological advancement is allowing us to move closer to the goal of scar-free and pain-free major surgery,” he said during the Medical Innovation Summit at Cleveland Clinic.

Clinical application of *LESS* has progressed more rapidly than for *NOTES* due to its conceptual similarity in approach to standard laparoscopic surgery, which means a shorter learning curve for physicians. At this writing, more than 120 *LESS* procedures, including donor, radical, and partial nephrectomy; unilateral and bilateral pyeloplasty; adrenalectomy; renal cryoablation; and prostatectomy have been performed in humans at a handful of centers nationwide.

LESS requires a single 2- to 3-cm skin incision that may be concealed within the umbilicus, allowing for a virtually scar-free operation. In a novel transluminal variation on the concept, Mihir Desai, MD, director of the Stevan B.

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 Stroom Center for Endourology at the Cleveland Clinic’s Glickman Urological and Kidney Institute, has performed more than two dozen simple prostatectomies for giant benign obstructive prostatomegaly via a single port percutaneously inserted into the bladder.

Patient satisfaction with *LESS* is high, Dr. Gill reports. In his series of nearly 20 *LESS* live-donor nephrectomies, the technique was associated with less analgesia, more rapid recovery

and return to work, and greater scar satisfaction in comparison with conventional laparoscopic nephrectomy.

In contrast, the current status of pure *NOTES* is more difficult to assess, Dr. Gill said. Panelists at the Innovation Summit estimated that 300 procedures in human subjects have been performed worldwide, virtually all in the realm of general surgery.

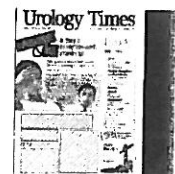
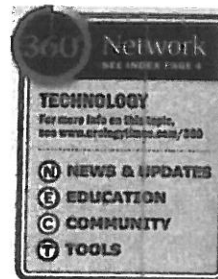
“Clearly, this is very encouraging. At the same time, it is important to note that the overwhelming majority of them have been performed in a *NOTES*-assisted format using one or more abdominal trocars in addition to the natural orifice,” Dr. Gill said.

Dr. Gill and his former team at Cleveland Clinic have performed five pure transvaginal nephrectomies in the porcine model. In addition, Dr. Gill has attempted three *NOTES*-assisted nephrectomy procedures in humans under institutional approval. In each human case, the procedure had to be converted to a transabdominal laparoscopy due to lack of technical maneuverability or inadequate retraction or visualization.

Urologists pushing the envelope with these techniques agree that technology is the limiting factor. Sur-

geons currently are adapting technologies and instruments designed primarily for multi-port standard laparoscopic procedures for *LESS* and *NOTES*, which limits the type of procedures that can be undertaken safely.

“Success is all a matter of visualization and tissue manipulation,” Dr. Gill said. “Intra-abdominal operative triangulation is essential. This will



be better delivered by purpose-designed instruments and robotic systems engineered specifically for single-port *LESS* surgery.

"Applications for **NOTES** are likely to be limited to technically simpler procedures," he said. "For more substantive, heavy-duty ablation and reconstructive surgery, *LESS* will carry the day."

Many urologists are cautious about adopting *LESS* and **NOTES** before substantial clinical and economic benefits of using these techniques have been documented. Others, like Dr. Gill, believe that cutting-edge innovation is the necessary first step in gathering the desired data to compare these techniques with standard laparoscopy.

Dr. Gill discloses that he is affiliated with Hansen Medical. ■■■

