Magnetic System May Prevent Surgical Scars

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Physicians at the University of Texas (UT) Southwestern Medical Center, Dallas, and engineers at UT Arlington invented a system that could be key to delivering surgery without scars.

The technique, called the Magnetic Anchoring and Guidance System, is still in the developmental stage. It involves magnetic maneuvering of laparoscopic surgical tools that have been inserted into the abdominal cavity through the navel or throat. However, the challenge is to design the new instruments and determine how to move them once they are inside the body.

“A fixed hole has a limited working envelope that is conical in shape,” says Jeffrey Cadeddu, MD, associate professor of urology and radiology and director of the Clinical Center for Minimally Invasive Treatment of Urologic Diseases.

The idea of using magnets to manipulate the instruments in the abdominal cavity was formulated after Cadeddu watched a television show featuring teens who used magnets to hold studs on their lips to avoid getting the implants pierced.

The system uses a stack of magnets outside the abdomen to attract other magnets attached to laparoscopic instruments inside the abdomen. Surgeons can then move the outside magnets to position an internal camera at the best viewing angle or to move a retractor or other surgical instrument. Once optimally positioned, the instruments can be placed. This allows a greater range of maneuverability and the surgical team can more easily reposition the instruments.

According to Daniel Scott, MD, assistant professor of surgery at Southwestern, the technology may solve the fundamental problem of guiding instruments through the abdomen for natural orifice surgery, which now involves inserting instruments through the throat, colon, or vagina.
Cadeddu and his colleagues conclude that the ability to reduce the number of trocars (holes) necessary for laparoscopic surgery has the potential to revolutionize surgical practice, but caution that there will be a learning curve. Until a system is fully tested in humans, surgeons will not know whether fewer entry points will result in fewer complications or faster healing—advantages usually seen in moving from conventional surgery to laparoscopic surgery.

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