Taking the Danger out of Abdominal Access

Among the most critical steps required in any laparoscopic surgery is establishing a port of entry into to abdominal cavity and gaining access to the surgical site. This can prove to be one of the riskiest parts of the procedure. Access is generally achieved using a trocar encased in a sleeve or cannula. The central trocar, or obturator, is used to pierce the abdominal wall and is then removed leaving the cannula as an access port to abdominal cavity. The risk lies with the initial entrance into the abdominal cavity. This is the one part of the procedure that the surgeon generally has to perform blind, unable to see the pierced tissue or what lies directly beneath it. While there are a broad range of styles and types of trocars currently on the market, many have sharp tips or blades to help them through the abdominal wall. These sharp tips and edges, combined with the penetration force required from the surgeon to cut into the abdomen, present a number of risks, such as cutting an artery or injuring the bowel. Fortunately, a number of medical device manufacturers have been developing safer systems and techniques to assist the surgeon in setting up a port of entry into the abdominal cavity while reducing the risk of injury to the patient. SurgiQuest, Inc. (Orange, CT.) has developed a truly innovative abdominal entry system built on a proprietary technology that addresses many of the problems and inconveniences that until now was seen as an inevitable aspect of laparoscopic surgery. The AirSeal system employs an invisible air barrier within the access port's 2-12mm cannula housing that automatically self adjusts to maintain constant and proper intra-abdominal pressure using the company's Dynamic Pressure System (DPS 1000) unit. As the system dynamically delivers constant CO_2 flow, it creates a less physiologic stressful abdominal environment for the patient and provides the surgeon with unobstructed and unprecedented freedom to operate. Once the abdomen is properly insufflated, the DPS 1000 system filters and directs CO_2 into the AirSeal cannula housing and tiny internal jets produce a pressure barrier within the cannula that is greater than the pressure of the inflated abdomen. This pressure barrier is dynamically monitored in real time to spontaneously balance, maintain and adjust the intra-abdominal pressure to the desired setting, even when suction is being used. This invisible "air seal" effectively separates the intra-abdominal gas from the ambient room air. Traditional trocars utilize a series of mechanical seals or gaskets to maintain pressure in the abdominal cavity. These seals limit the number and sizes of instruments that can be used and routinely become soiled as instruments are repeatedly inserted and removed, and also smudges the scope lenses. The AirSeal system requires no mechanical seals or gaskets within its access ports, allowing single or multiple laparoscopic instrument insertion into the abdomen and making specimen removal is easier and safer, without loss of insufflation. In addition, by allowing multiple instruments to be used without interfering with the intra-abdominal pressure, AirSeal is poised to lead the way in true "Single Port" surgery with one larger size port. The AirSeal system also offers a built-in smoke evacuation system, as it filters and refreshes the intra-abdominal gas. The system improves operating room staff safety as potential airborne pathogens are never allowed to escape into the OR. Another unique and

innovative abdominal entry product offered by SurgiQuest is the AnchorPort®. It can be used for peripheral applications or for single incision surgery. Each 5-mm AnchorPort optical tip trocar is precisely placed for maximum safety and employs its patented elastomeric technology to match the cannula length to the thickness of each patient's abdominal wall. This eliminates all the problems associated with fixed length cannula that cause hand instrument "sword fighting" and large conventional cannula housings that prevent instruments from reaching the surgical site and require constant readjustment of the cannula. The AnchorPort's elastomeric anchor also eliminates the problem of trocars pulling out or shifting as hand instruments are inserted and removed. Committed to improving surgeon access and reducing patient trauma in laparoscopic procedures, Covidien (Mansfield, MA) offers a line of bladeless trocars. The VersaStep Plus 15mm is a bladeless laparoscopic access system with a radially expandable sleeve that minimizes the fascial defect and reduces the downward insertion forces associated with normal trocar insertion. The VersaStep Plus 15mm is an addition to the existing VersaStep Plus line and offers all of the benefits of Covidien's proprietary STEP technology. Also available are the new Covidien Versaport Plus Bladeless Trocars, a complete product line offering secure entry technology for enhanced security and control. Versaport Plus Bladeless offers surgeons low insertion force, small fascial defect and superior fixation; important features surgeons consistently ask for in bladeless technology. Teleflex Medical (Research Triangle Park, NC) recently welcomed Taut, Inc., an innovator of devices for minimally invasive surgical procedures, into its family of brands. Taut specializes in laparoscopic surgery and other minimally invasive solutions, offering products for general surgery and specialized gynecological, bariatric, pediatric and urologic procedures. Among Taut's product lines are the ADAPt bladeless laparoscopic access devices. Designed to minimize complications in laparoscopic surgery, ADAPt ports are an alternative to traditional bladed trocars. These innovative laparoscopic ports eliminate the blades and provide a tip that passes through tissue without cutting, avoiding bladed injury and leaving a 58 percent smaller fascial defect than the most commonly used bladed trocars. ADAPt ports are designed to allow for the application of minimal downward pressure while gaining peritoneal access in an efficient, controlled manner. The port's asymmetrical tip seeks the path of least resistance through each fascial layer and the peritoneum and creates a tight, non-linear defect that helps keep the port in place and aids in closure of the defect. Ethicon Endo-Surgery (Cincinnati, OH) offers an extensive selection of trocars to assist with virtually any minimally invasive access requirement. Their innovative ENDOPATH® Xcel line is the result of over three years of designing, aimed at meeting the need of the most demanding procedures and surgeons. The ENDOPATH Xcel trocar is engineered to facilitate hassle-free precision and efficiency during surgical procedures and is available in bladeless and blunt tip configurations. The ENDOPATH Xcel Bladeless trocar has applications in abdominal, thoracic, and gynecologic minimally invasive procedures to establish a path of entry for Endoscopic instruments. The trocar may be used with or without visualization for primary and secondary insertions. It features a more durable seal that ensures constant insufflation and results in a smaller fascial defect and less trauma to the abdominal wall and vessel. The ENDOPATH Xcel Blunt Tip trocar is equipped with a seal that minimizes bodily fluid transfer to the camera lens and is designed for use in application in thoracic, gynecologic, laparoscopic and other abdominal procedures. The blunt tip gently moves aside internal viscera as it

enters the body, so that after the initial incision there is no further cutting requires. And, following the procedure, the separated tissues can reunite, minimizing trauma. Applied Medical's (Rancho Santa Margarita, CA) Abdominal Access System, which includes the Separator® access system, Universal® seal, Premium disposable trocar system and Convertible® trocar system, offers hospitals unlimited flexibility without sacrificing the benefits of standardization. All components are interchangeable, allowing an ideal mix of reusable and disposable cannulas and obturators and accommodating surgeon preference for either bladed or non-bladed systems. The latest innovation in the Applied Medical abdominal access product line is the GelPort® balloon trocar. Featuring the advanced GelSeal® bolster, this balloon trocar allows enhanced instrument articulation as it maintains pneumoperitoneum and adjusts to varying abdominal wall thickness. The latex-free balloon ensures the utmost stability throughout lengthy procedures. The GelPort also incorporates Applied Medical's Universal seal, which accommodates instruments from five to 12 mm without an adaptor, and the 10/12-mm cannula accommodates large instrumentation and eliminates the need to stock multiple sizes. As more and more surgeons and specialties move to minimally invasive approaches, medical device manufacturers and marketers are rising to the occasion and helping to advance the technology that is advancing surgery itself. In the case of trocars, this means taking some of the risk and danger out of one of the most crucial steps in laparoscopy the initial access.

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