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HONG KONG ADVENTIST HOSPITAL SUCCESSFULLY COMPLETES ASIA'S FIRST DA VINCI ROBOTIC SINGLE-SITE CHOLECYSTECTOMY USING THE LATEST DA VINCI ROBOTIC SINGLE-SITE SURGERY SYSTEM

- *Reducing the Associated Risks of Bleeding, Infection and Complications;*
- *This system allows patients with complicated gallbladder stone disease to enjoy the benefit of single-site minimal invasive cholecystectomy.*

[October 8, 2013, Hong Kong] Recent advances in minimally invasive surgery (“MIS”) have led to an increasing demand for even less invasive procedure, hence the development of single-site MIS in the late 2000’s.(started from 2007-2008) However, not every patient can receive single-site MIS. Taking cholecystectomy as an example, over-weight patients or those with a history of cholecystitis may not be suitable for single-site minimally invasive cholecystectomy, and must instead rely on more traditional multiport laparoscopic surgery or even open surgery with a large surgical wound. Fortunately, a new robotic surgery system, namely da Vinci Single-Site Surgical System, which allows robotic precision which cannot be matched by traditional MIS is now available to Hong Kong patients, enabling even patients with complicated gallbladder stones disease to undertake single-site cholecystectomy.

The gall bladder is a small organ located at the upper-quadrant of our abdominal cavity, just beneath the liver. The gall bladder function is to temporarily store bile secreted by our liver, to aid fat digestion. When food is consumed, hormones stimulated our gallbladder to contract, therefore, forcing the stored bile to pass into our intestine via the common bile duct to help digestion of fatty vitamins and acids. Imbalances of bile acid composition lead to crystallization, therefore forming gallstones. Gallstones can be of varying sizes.

Gallstones can cause cholecystitis and may result in a life-threatening sepsis

Dr George Yang, a specialist surgeon at Hong Kong Adventist Hospital, says we should never downplay gallstones “because they may be stuck at the neck of the gallbladder, thereby causing obstruction and if infected by bacteria can cause cholecystitis. The stones may also pass into the common bile duct causing blockage, which may result in jaundice, cholangitis or acute pancreatitis. These diseases may lead to life-threatening sepsis.” There are different types of gallstones. Medication treatment can only treat pure cholesterol stones; however, the efficacy is commonly not

satisfactory and the risk of recurrence is high. Therefore, it is more appropriate to treat gallstone with cholecystectomy, to remove the entire gallbladder together with its stones inside through surgery, of which there are two types of surgeries available: open cholecystectomy and laparoscopic cholecystectomy.

Open surgery through a 20cm long incision

Dr Yang explains that before 1980s doctors commonly performed open cholecystectomy, and this involved making a roughly 20cm long incision on the patient's abdomen to remove the gallbladder surgically. Since early 1980's, with the development of multi-port laparoscopic surgery, which allows surgery to be performed with a laparoscope and several 10mm instruments, cholecystectomy was successfully performed via this keyhole approach.

Multi-port MIS reduces surgical risks, But a higher chance of complications

“With open surgery, the wound is much larger, cutting across several layers of abdominal muscles. This resulted in more bleeding, higher risk of wound infection, and associate with higher rate of chest related complications and postoperative pain. Its means the recovery time is much longer, which associate with longer hospitalization. Multi-port laparoscopic surgery reduces the size of the surgical wound, the amount of bleeding, lowering the risk of wound infection and other complications. It also shortens the patient's post-operative recovery time and hospitalization. However, multi-port laparoscopic surgery is not without risk. As there is 5 to 10mm more incisions made on the abdominal wall, every one of these incisions poses a risk to patients. These include among others an injury to a main blood vessel in the muscle layer; an injury made to the small intestine during sharp trocer insertion; and an incisional hernia. Therefore, the medical community is not satisfied and has developed the single-site MIS.”

Wound of single-site MIS is only 2.5cm in diameter, Lower wound-related complications

As its name suggests, single-site MIS requires only a single incision. A 2.5cm long incision is made at the navel and the wound is hidden within the navel itself. Dr Yang explains: “This can reduce the risk of damaging blood vessel in the muscle layer; and since the number of surgical wounds is reduced, wound-related risks and complications are reduced too, including the risk of wound bleeding, bowel injury and incisional hernias. Single-site MIS will also improve the final cosmetic result, thereby reducing the damage to the patients' bodily image post-operatively”.

Over-weight patients or those with a history of cholecystitis should not receive traditional single-site laparoscopic cholecystectomy

However, some patients cannot receive conventional single-site laparoscopic cholecystectomy. This is because, as Dr Yang explains, “using standard MIS equipment (utilizing a 2-dimensional camera) in single-site cholecystectomy makes it more difficult for surgeons to grasp a ‘sense of dimension’ and making it difficult for us to appreciate the surgical anatomy. Moreover, the instruments and laparoscope are aligned together thus obscuring the laparoscope images. Thirdly, such equipment cannot bend and rotate; even if they can, their control is difficult, making the surgery much more technically demanding. The problem will be aggravated further if we are facing difficult patients, including those with previous cholecystitis, cholangitis or pancreatitis which may induce thickened gallbladder wall and adhesion to surrounding organs, or those with higher Body Mass Index (BMI), in which surgery is much more difficult. Therefore, these patients may require traditional multi-port laparoscopic cholecystectomy or even open cholecystectomy which shall result in a larger incision.”

Single-site MIS utilizing da Vinci Robotic Surgery System will widen surgeons’ visual scope

Fortunately, the da Vinci Robotic Single-Site Surgery System has been introduced in Hong Kong. Dr Yang explains: “The da Vinci Robotic Surgery System is equipped with a 3-dimensional camera which is 8.5mm in diameter, stable robotic arms, and bended instruments introducers that can be controlled with precision, which function to align the instruments in an angle, avoiding blockage of vision and widening the visual scope available to surgeons. The stable robotic platform also allows dissecting instruments to be easily and precisely controlled.” With the use of this system, you only require one small incision at the navel, leaving no visible scar upon recovery.

More patients benefit from da Vinci Single-Site Surgery

Dr Yang points out that the introduction of the da Vinci Robotic Single-Site Surgery System will enable more patients to receive single-site cholecystectomy, redefining the limits of the procedure. “In the past, patients with gallstones who had a high BMI or a history of cholecystitis could not receive single-site MIS. The good news today is that they now can, thanks to the da Vinci Robotic Single-Site Surgery System.”

HKAH successfully completes Asia's first two cases of single-site Cholecystectomy by using the Single-Site da Vinci Robotic Surgery System

Hong Kong Adventist Hospital has successfully completed Asia's first two cases of da Vinci Robotic Single-Site cholecystectomy. The first case involves a middle-aged male patient with multiple gallstones suffering from chronic cholecystitis. The second case also involves a middle-aged male patient suffering from acute cholecystitis, this time due to several small-sized gallstones and sediments, with symptoms including pains in the upper abdomen. Ultrasound abdomen performed showed their gallbladder was distended with symptoms of early cholecystitis, so both patients were recommended cholecystectomy. The concerns from both patients were safe surgery, minimized wound related complication with high cosmetic result.

Dr Yang says that the resection times (to remove the gallbladder) required for both cases averaged only 37 minutes, and the patients indicated a post-operative day one pain score of only 2 on a scale of 10 (with 10 being the most pain). Both patients only required a one-night stay in hospital.

Dr Yang reminds patients that before deciding on the type of surgery, they should discuss with their family doctors and surgeons so as to have a more detailed understanding of the different types of surgery available and their related risks.

Hong Kong Adventist Hospital expects MIS with the da Vinci Robotic Surgery System to be applicable for surgical procedures of obstetrics & gynaecology and those related to liver, stomach, spleen, and colon, among others, so more patients may benefit from the technology.

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