Practical tips for laparoscopic and robotic surgery

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Lecture : Choledochal cysts are abnormal dilatations of the extra- and/or intrahepatic biliary tree that are thought to be congenital in origin. Babbit's theory of APBDJ (anomalous pancreaticobiliary duct junction) is the most accepted hypothesis in pathogenesis of choledochal cyst.(1) Although choledochal cyst is a relatively rare disease, there is an apparent increase in its recent incidence due to the popularity of routine check-ups and imaging improvements. The incidence of choledochal cysts shows significant geographic variation, being higher in the Asian population and reaching up to 1 in 1000, and have a female predominance.(2, 3) Complete excision of the cyst is the best treatment strategy to avoid long-term complications especially malignant transformation, recurrent cholangitis and gallstones(2, 3) There is widespread common acceptance that complete removal of the dilatated biliary tree is regarded as inevitable to eliminates the biliary stasis and recurrent cholangitis and removes the major site of susceptibility to malignancy.(4, 5) Complete removal of the cyst is important as a malignancy rate of 33% has been reported with incomplete removal, compared to 6% with complete resection.(6) With advancement in laparoscopic and robotic techniques and growing surgical expertise, many surgeons have introduced these procedures using minimally invasive approach and comparable or even better outcomes to its open counterpart have been reported in the literature.(7-9) Because of prevalence of choledochal cyst in young female, laparoscopic surgery has been widely adopted in terms of cosmetic outcomes as well as general advantages of the minimally invasive surgery including earlier recovery. However, due to the limitations of laparoscopic surgery, robot surgery is being performed gradually.(9, 10) The operation of the choledochal cyst requires a delicate procedure for complete removal of the involved bile duct including the intrapancreatic portion, followed by an elaborate reconstruction of the bile duct. However, each surgical method has advantages and disadvantages. Laparoscopic surgery has the advantages of being quick to replace the instruments during the operation and easy to cover a wide surgical range, while there is no articulation of the effector instrument, which limits the range of motion. On the other hand, robotic surgery takes a long time to exchange instruments, which reduces the ability to cope with hemorrhages, but it provides articulating movements of instruments like human hands and exerts excellent effects in the reconstruction stage requiring elaborate suture. Another disadvantage of robot surgery is lack of tactile sense. Due to these differences in the two surgical methods, there are some caveats to be noted at each surgical stage. The advantages of robotic surgery in the reconstruction stage are even better.(9, 10) Either way, care must be taken in the resection phase where removal of the transitional area of choledochal cyst at the pancreatic head is necessary, but robotic surgery that has complete absence of tactile sense compared to laparoscopic surgery requires considerable care. Jang et al.(8) also noted that caution should be exercised in manipulating the transitional area of the intrapancreatic bile duct. For this reason, we also perform a total robotic surgery in choledochal cyst, but prefer a hybrid method that uses robotic reconstruction after laparoscopic resection. In this context, Jang et al.(10) also introduced the advantages of this hybrid approach.

Minimally invasive surgery is becoming generalized for choledochal cysts, and its feasibility and safety have been reported in many studies. As technology advances, the means available are also becoming more diverse. If the choice of operator's preference and appropriate means for each surgical procedure is selected, more accurate and safer minimally invasive surgery could be performed.

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