Progress and future direction in abdominal surgery

—Potential of absorbable reinforcement materials—

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GUNZE
have been introduced one after another, and the incidence of bleeding during surgery has greatly decreased. The introduction of endoscopic operations, which is difficult to perform when the visual field is red due to bleeding, has contributed to better hemostatic treatment and a decrease in the amount of bleeding. However, it does not mean that the operation time is prolonged to perform such careful hemostatic treatment. The time is actually shortened. The surgical basics, such as cutting with forceps, clipping, dissection and suturing, however, are the same as before. Since it takes a tremendous amount of time to acquire these skills, adequate practice is required.

Q2 Please tell us your opinion regarding the techniques in gastroenterological surgery (especially for pancreatic and hepatic cancers).

These operations are not easy. Of all gastroenterological surgery, operations on hepatic and pancreatic cancers are some of the biggest and most difficult operations. They require more accurate knowledge of anatomy and physiology. One small mistake may cause massive bleeding or a life-threatening complication after the operation, and therefore accurate surgical operations are necessary. It takes a tremendous amount of time to acquire these surgical skills. Recently, it has been said that the number of surgeons is decreasing, especially those who are willing to become surgeons who perform surgery on hepatic and pancreatic cancers. Surgery of hepatic and pancreatic cancers is not the type of operation that anyone can learn immediately; it requires at least 10 years of practice. It is impossible to increase the number of surgeons, just because they were decreased. I am concerned that it may become a significant issue in the future.

Q3 It seems that the scale of operations has been smaller in general. What do you think?

I think operations are becoming more appropriate, rather than just smaller. Some may require smaller lesion resection and lymph node excision, but others may require larger resection if it is considered to be too small. Of course, lesions must be removed as far as possible to reduce the chance of recurrence, but the operation will become more invasive. In some cancer operations, it has been revealed that large-scale operations do not necessarily contribute to an improved prognosis. Therefore, operations generally tend to be smaller these days. Smaller operations are certainly more advantageous in terms of post-operative QOL. It does not mean, however, that those operations are easier
compared to the standard operations, but rather they may be more complicated and require more accurate and precise knowledge of anatomy. Even with lymph node excision itself, discussions are underway on whether the operation should be smaller, larger, or just the standard. It is important that operations are more appropriate, and that they are standardized.

Please tell us about hepatectomy, including past and present techniques.

I’m not specialized in hepatectomy, and I mainly perform hepatectomy in patients with liver metastasis from colon cancer. The prognosis of liver metastasis from colon cancer has improved remarkably due to advances in chemotherapy. However, since a complete cure cannot be achieved without removing the lesion, resection is performed as far as possible. In addition, metastatic lesions in the liver, which used to be unresectable before, have become resectable in some cases due to the remarkable outcome of chemotherapy. I pay special attention not to be too invasive when resecting a lesion. With regard to hepatocellular carcinoma, which is a primary hepatic carcinoma, the number of unresected cases has decreased due to such methods as TAE, PEI, radio frequency ablation, and microwave coagulation therapy.

Please tell us about pancreaticoduodenectomy and distal pancreatectomy, including past and present techniques.

The general surgical techniques are as I mentioned earlier. Like other kinds of surgery, pancreatic surgery has also advanced greatly compared to before. With pancreatic surgery, however, the techniques have not been standardized on many points, even though it definitely has advanced. For instance, issues such as what to do with the edge of the resected pancreas or the pancreatic duct are generally discussed, so is reconstruction in pancreaticoduodenectomy. A standard has been established to some extent for the operations of gastric and colon cancer, but it has not reached that level for pancreatic cancer yet. Pancreatic surgery requires very difficult techniques. In addition, it is characterized by post-operative complications that are likely to be serious. However, I believe this surgery will further improve in the future. The prognosis of pancreatic cancer is extremely poor, unless it is treated early. Therefore, early detection of the disease is very important. However, the disease cannot be eradicated without resecting the lesion. Chemotherapy for pancreatic cancer has also advanced by the introduction of gemzar and TS-1, etc., which has led to better prognosis. Even if a complete cure is not achieved, patients’ QOL has improved. I strongly hope that the improvement of surgical techniques will contribute to the improvement of pancreatic cancer treatment.

Please tell us about the complications of hepatic and pancreatic cancers, such as bile or pancreatic leak, and the types and roles of hemostatic and reinforcement materials.

Bile and pancreatic leaks occur at a certain rate. Once it occurs, the condition can become very serious. In order to avoid this, we must be very careful when we perform surgery, but
it still occurs at a certain rate. The only thing we can do when it occurs is to do our best to avoid worsening of condition. In addition to this, I think it will be very helpful if we can somehow use hemostatic and reinforcement materials during the treatment. For instance, I try to prevent bile and pancreatic leaks mainly by using NEOVEIL and fibrin glue concomitantly. Since they are used in most cases recently, there is no data available comparing groups who are treated in combination with these tools with groups who are not, but it seems to me that the incidence of bile and pancreatic leaks has actually decreased. Besides, no serious complications related to the use of NEOVEIL have occurred. I believe NEOVEIL is a reinforcement material with high expectations for its usefulness. I have used NEOVEIL and fibrin-glue in more than 200 cases since around 2005 until today, and I still feel very comfortable using them.

Q7 Please tell us about the method of using NEOVEIL for the liver and pancreas

NEOVEIL is a polyglycolic acid (PGA) sheet, which is an absorbable suture reinforcement material, and it is used concomitantly with fibrin glue. We have confirmed the clinical efficacy of NEOVEIL in the field of thoracic surgery for the closure of fistula after resection of lung tissue. Based on the experience obtained in thoracic surgery, I have clinically applied NEOVEIL for abdominal surgery, and I have used it during operations on the pancreas and liver for a long time. For the pancreas, I use NEOVEIL at the edge of the resected pancreas or for anastomosis of the pancreas and the digestive tract. I consider that pancreatic leaks occur to some extent from the edge of resected pancreas and it heals naturally. NEOVEIL is also a material that is used in regenerative medicine, and seems to be the scaffold for cells that stimulate healing. Therefore, in the beginning, I used to attempt to cover the lesion entirely and firmly in order to prevent pancreatic leak when placing NEOVEIL, but now I think it does not make much difference if it is slightly loose. For instance, in the beginning, I used to apply Solution A of fibrin-glue (fibrin powder dissolved in aprotinin solution), thoroughly to the indicated site, place NEOVEIL, and then apply the remaining Solution A and Solution B (thrombin powder dissolved in calcium chloride solution, at the same amount as the aprotinin solution) simultaneously over NEOVEIL, as done in thoracic surgery. However, these days, I just place NEOVEIL widely over the surface where the pancreatic or bile leak should be prevented, and apply fibrin glue over the NEOVEIL to fix it.

Q8 Finally, tell us your opinion about the future of reinforcement materials?

I feel very comfortable using NEOVEIL now. I hope that its clinical efficacy will be proven and problems will be identified in the future as it is used more widely in abdominal surgery, and that the product will thus be further improved to achieve a better outcome of the operation. I also expect to see improvements in the size, thickness, density, and other qualities.