Technical Note

Laparoscopic assisted multi-visceral resection in stage IV rectal cancer

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Abstract: Hepatic metastasis is the difficult part and key point in treating colorectal cancer. Meanwhile, there still exists an argument that if doing hepatic metastasis of colorectal cancer resection simultaneously. Our center is carrying on multidisciplinary treatments of hepatic metastasis of colorectal cancer and has gained some outcomes from the clinical trials. According to the features of this case, we should get simultaneous resection of both primary and metastatic tumor following by the pre-operation MDT discussion. Here, we show the achievement of laparoscopy-assisted right hemicolectomy combined with liver resection. We want to share the experiences and discuss with each other.

Keywords: Laparoscopy; colectomy; hepatectomy; simultaneity

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Liver is the primary hematogenous metastatic organ of colon cancer. Hepatic metastasis is the difficult part and key point in treating colorectal cancer. Generally, hepatic metastasis is the main death reason of colorectal cancer. The principle of treating hepatic metastasis of c is surgical resection of metastatic lesion. Till now, Chinese and foreign experts consensus suggest that colorectal cancer patients with hepatic metastasis that meet the surgery indication should have appropriate surgical treatment.

Usually our strategy for colorectal cancer with hepatic metastasis is MDT discussion. We got the further treatment strategy when experts from different departments have discussed together. We decide whether the patients should get simultaneous resection of both primary and metastatic tumor mainly on the anatomic site of the metastasis, the residual liver function, the number of metastatic lesion and radical purpose. Although the mortality of simultaneous resection surgery is higher than two-period surgical therapy, there are emerging studies showing that the overall survival and disease-free survival rate are similar between the two therapies. Our medical center has carried out laparoscopy-assisted simultaneously multiple organ resection, and has got some results. Here, we show the achievement of laparoscopy-assisted right hemicolectomy combined with liver resection. We want to share the experience and discuss with each other.

Body position

Supine position, hands at body side, avoids hands abduction in order not to influence the operation of surgeon. For better view of the operation field, we change body position by the adjustment of operating table.

Position of surgeon

The primary operator stands at right or between the two legs of the patients. The operator that holds the laparoscopy stands at the left side of the patient, while the operator that holds the assistant pincers stands next to the primary operator. The main purpose of the assistant pincers is helping to show better views. Obviously, during the operation, the three operators could change the position to make the primary operator feel convenient as much as possible.

Figure 1 This video is about the laparoscopic colectomy combined hepatectomy surgery (1). Our team finished the application of laparoscopy operation. This case is the advanced skill compares to other hospitals in China.
Available online: http://www.asvide.com/articles/1518

Trocar position—usually, we use five trocars

(I) Observational trocar: 1 cm upside the belly button, avoid side-effects caused by puncture. This trocar site is chosen because the relative low density of fat. However, when isolating superior mesenteric vein, a vertical sight cannot be avoided. The vertical sight needs operator to accommodate.

(II) Main operational trocar: the primary main operational trocar was 2 cm right of the ligature between the belly button and symphysis pubis; the secondary main operational trocar was 3 cm left of belly button.

(III) Assistant operational trocar: the primary assistant operational trocar was the down border of the right costal arch; the secondary assistant operational trocar was the left down border of the costal arch at the same line with nipple. The assistant pincers was mainly to pull transverse colon, omentum, stomach and liver in order to show the better view.

Operation procedure (*Figure 1*)

We facilitate the middle pathway, from upside to downside, from medial to lateral. First we isolated the ileocolic artery and vein, and then we cut off the colic mesentery along the left side of superior mesenteric vein. Then we dealt with the right branch of middle colic artery, and we clean the six station lymph nodes when opened the omental bursa. We isolated the total colic mesentery according to the CME principle. Finally, we did the anastomosis outside the body. Procedures related to the malignant tumor resection conformed to the no tumor touch principle; we usually carried out D3 radical resection.

Abdominal exploration

Colorectal cancer patients need thoroughly abdominal exploration, from far to near, to be sure whether there were metastatic sites in abdomen.

Reveal the anatomic marks

Change the operating table to make the patients head is high and the legs are low while make the left side of body low and the right side high. Pull the small intestine at the inferior left part of the abdomen by gravity in order not influence the operating maneuver. The primary operator and the assistant put the greater mesentery up of transverse colon. The assistant operator pulls the transverse colon in order to reveal the middle colic vessels, superior mesenteric vein and the horizontal part of duodenum. At this time, the assistant operator pulls the colic mesentery and keeps some tense.

Isolation of ileocolic vessels

The primary operator reveal, isolate and cut off the ileocolic vessels at the bifurcation of ileocolic vessels and mesenteric vessels, be careful about the anatomic variation. After cutting off the ileocolic vessels, isolating the mesentery along the superior mesenteric vein, pull the isolated tissues to the right side and enough space left. In this enough space, we find out Toldt's space. Beginners would use no harm pincers to hold the gauze to facilitate blunt dissection. Blunt dissection help to avoid the side effects to duodenum. When dealing with the mesentery of fat people, be careful about the reproductive vessels and the ureter, for the anatomic markers were not clear in fat patients.

Cut off right colic vessels and the right branch of middle colic vessels

Isolate the mesentery along the superior mesenteric vein. The assistant operator who holds the laparoscopy should adjust a 30 degree. The right side of vessels usually has anatomic variation, so please be sure about the line that vessels flow. During these procedures, be careful about the pancreas.

Clean the lymph nodes at the root of middle colic artery

When cleaning the lymph nodes, we should pay lots of attention, because there are lots of the anatomic variations. The vessels needs to be skeletonized, we must manage the use of ultrasound knife. Be careful about the side effects of ultrasound knife, during these procedures, Toldt's space extent to the paracolic sulci.

Cut off greater omentum and omental bursa

The assistant operator help to pull the great omentum, cut off the great omentum in the middle to the root of transverse colon. Open the omental bursa and clean the sixth station lymph nodes. Isolate transverse colon along omental bursa and keep careful about the gall bladder.

Isolating liver colon treatment. And paracolic sulci

At this time the tissue between right hemicolon and paracolic sulci was only a thin film. Some patients would see the Toldt's line.

Deal with ileocecal part

Carefully recognize the fusion part of ileocecal part and the later abdominal wall. When dealing with these using ultrasound knife, the maneuver should slow down. By this, the right hemicolon were isolated.

Resection of hepatic metastatic lesion

If the metastatic lesion was on the surface of liver, we should define the scope using electronic hook. Resect the metastatic lesion using electrocoagulation. As the liver is brittle, some stitches would be needed to pull the organ. The primary operator pulls the lesion and resects the lesion while the assistant uses the aspirator. The resected lesion should be put into bags according to no tumor touch principle.

Cut off transverse colon and side to end anastomosis

Cut off the transverse colon in the body, also cut off or remain the ileum. Whether cut or remain the ileum depends on the thoughts of primary operator. Elongate the observational trocar hole and make sure the tumor could be carried out through the hole. After the anastomosis, we usually did the reinforce stitches in order to avoid the anastomosis fistula and bleeding.

Close the lesion and abdominal exploration again

After close the lesion, we re-established the pneumoperitoneum. Re-evaluate the anastomosis direction, mesenteric direction. Check that whether there exist side-effects.

Experience

Laparoscopic surgery should follow the no tumor touch principle as the open surgery. However, the operating space is limited so that the cooperation seems important. In the surgery, we should take care of anatomic marks; avoid the small field caused isolation deviation. Thus, we should always adjust back to large views to make sure the isolating sites. Cutting off vessels at the root of the vessels so that we could have enough isolation, then we can decrease the difficulty of anastomosis. Vessels skeletonization by ultrasound knife needs practice and it definitely decreases the blood loss. The assistant that hold the laparoscopy should avoid angle problem to cause the primary operator puzzled.

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Footnote

Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at http://dx.doi.org/10.21037/jxym.2017.04.09). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee(s) and with the Helsinki Declaration (as revised in 2013). Written informed consent was obtained from the patient for publication of this manuscript and any accompanying images.

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