



LETTERS TO EDITOR

Preoperative carbon nanoparticles and titanium clip combined labeling method for transverse colon tumor surgery



Dear Editor,

We read with great interest the article entitled “Usefulness of preoperative CT colonography for colon cancer” by Sato K et al in the Asian Journal of Surgery.¹ The authors pointed that computed tomographic colonography (CTC) is an effective way to locate preoperative colon cancer. However, when the lesion is small (<10 mm), the sensitivity of this method is decreased. CTC is not appropriate when the lesion has already caused intestinal obstruction. And CTC needs to infuse at least 2L of carbon dioxide gas, which is not a good experience for patients. Accurate preoperative positioning is critical for laparoscopic colon surgery, so our team used the carbon nanoparticles and titanium clip combined labeling method for laparoscopic colon surgery. The location of colon tumor is crucial for the choice of surgical approach, especially when the tumor is located in the transverse colon. Because the resection range of the transverse colon tumor near the hepatic flexure is different with that near the splenic flexure, which make the approaches quite different.

Recent years, the role of carbon nanoparticles in the localization of colon tumors has been widely recognized.^{2,3} In our study, we used carbon nanoparticles combined with

titanium clip to localize the transverse colon tumors before surgery for definite surgical method and approach.

One day before operation, we adopted the ‘four quadrant method’⁴ and the ‘three-step injection method’⁵ to inject the carbon nanoparticles into the submucosa of the normal intestinal wall 1 cm from the edge of the tumor under the colonoscopy. Secondly, we place two titanium clips on the wounded surface (Fig. 1). Then the patient takes a plain film of the abdomen. And because the titanium clip is clearly developed on the X-ray. The position of the titanium clip on the image can represent the relative position of the tumor in the transverse colon (Fig. 2). 14 patients with a single transverse colon tumor were preoperatively positioned using this method. All patients could clearly see the location of the titanium clips and the location of the tumor was confirmed intraoperatively.

Nanocarbon helps to quickly find tumors during surgery, especially when the tumor is small or does not invade the serosa (Fig. 3). The titanium clip can not only stop bleeding on the wound surface under colonoscopy, but also accurately locate the tumor before surgery.

This method can more accurately select the position of the surgical incision for open surgery. As for laparoscopic

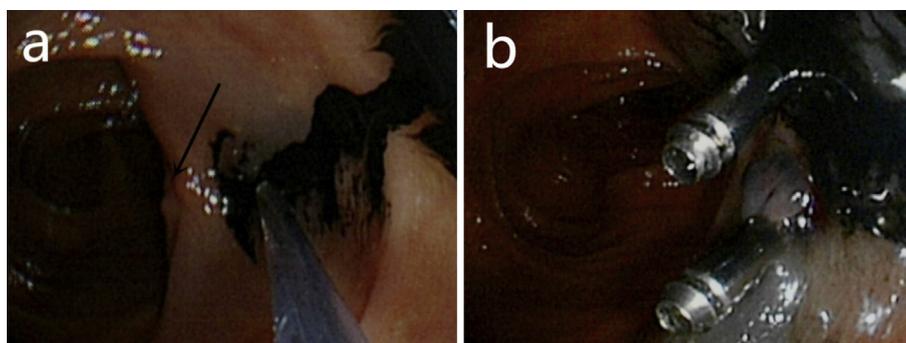


Figure 1 Nano-carbon and titanium clip combination labeling methods under colonoscopy. (a) Nanocarbon injection (The black arrow points to the lesion). (b) Titanium clip placement.

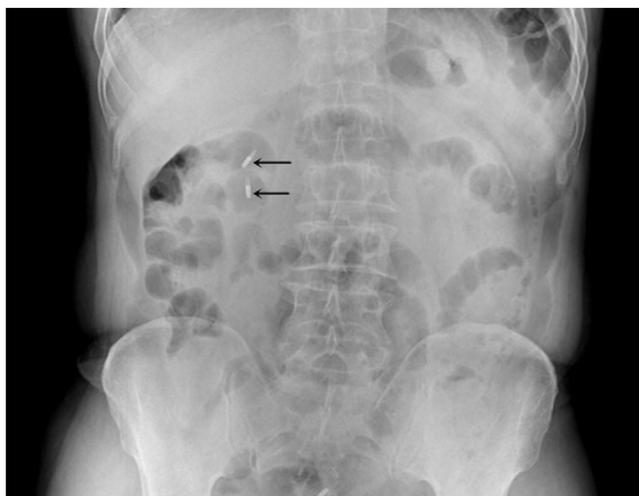


Figure 2 The black arrow points to the lesion and is surrounded by the nanocarbon staining area. The white arrow is two titanium clips.



Figure 3 The white arrow points to the nanocarbon staining area.

surgery, the position of the Trocar can also be determined, which is convenient for the operator and assistant operation reducing the difficulty of surgery and fatigue. It also contributes to the exposure of the surgical field, reduces the occurrence of intraoperative complications and ensures complete mesenteric resection.

This study demonstrates the potential role of this approach in reducing the difficulty of surgery and shortens the duration of surgery in transverse colon tumor surgery.

Competing interests

There are no conflicts of interest.

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