A New Device to Prevent Irregular Adsorption of Fatty Tissue While Using an Irrigation-suction Instrument for Laparoscopic Surgery: Divided Silicone Drain Tip

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Background: While using an irrigation-suction instrument for laparoscopic surgery, irregular adsorption of fatty tissue may damage the tissue or obstruct continuous sucking. A new device made up of a divided silicone drain tip to prevent irregular adsorption was reported.

Materials and Methods: A cigarette-type silicone drain was cut 4 cm in length. It was slipped over the instrument to cover the side holes, leaving 1.0 to 1.5 cm free from the end of the instrument. It was fixed by means of 1-0 silk above the side holes. Finally, the free tip was divided vertically into 4 even pieces like octopus arms.

Results: This device could prevent the irregular adsorption of fatty tissue (greater and lesser omentum, or epiploic appendices) and could suck saline, fresh, and coagulated blood almost continuously.

Conclusions: This simple and easy device facilitated the prevention of irregular adsorption of fatty tissue while using an irrigation-suction instrument for laparoscopic surgery.

Key Words: laparoscopic surgery, irrigation-suction instrument, irregular adsorption, fatty tissue, divided silicone drain tip

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While using an irrigation-suction instrument for laparoscopic surgery, irregular adsorption of fatty tissue (greater omentum, lesser omentum, epiploic appendices) into the end hole or side holes of the instrument has been experienced frequently. The sucked fatty tissue should be detached with forceps. This may cause the fatty tissue to bleed or may cause obstruction in continuous sucking. Herein, we report the use of a new device made up of a divided silicone drain tip attached to the end of an irrigation-suction instrument to prevent such irregular adsorption of fatty tissue.

MATERIALS AND METHODS

Several industrial companies manufacture a irrigation-suction instrument that can be inserted 5 mm trocar for laparoscopic surgery. The instrument, measuring 5 mm in diameter, is equipped with a main end hole and 8 to 12 pieces of small side holes for 1 cm length of the end. We, on the other hand, devised a cigarette-type silicone drain, of Type A No. 6 Penrose drain (Fuji Systems Inc., Tokyo, Japan). Type A means round, and No. 6 means 6 mm in outside diameter. The silicone drain was cut 4 cm in length, slipped over the instrument to cover the side holes, leaving 1.0 to 1.5 cm free from the end of the instrument. The silicone drain tip was fixed by means of 1-0 silk at the central site above the side holes of the instrument. Finally, the free part of the silicone drain was divided vertically into 4 even arms like octopus arms (Fig. 1).

As the instrument attached with the divided silicone drain tip could not be inserted from 5 mm trocar, it was inserted from 12 mm trocar or directly through the EZ Access (Multi channel port, Hakko Co., Ltd, Nagano, Japan) when placed on the abdomen.

RESULTS

The divided silicone drain tip could block and prevent the adsorption of fatty tissue that would be sucked by the instrument. Saline, fresh blood, and coagulated blood could be sucked through the divided silicone drain tip. This device was effective for sucking a large quantity of irrigated saline for a long period of time almost continuously.

FIGURE 1. The cigarette-type silicone drain tip divided vertically into 4 pieces and attached to an irrigation-suction instrument.

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The authors declare no conflicts of interest.

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DISCUSSION

We studied reports on available devices for irrigation-suction in PubMed and Japanese Medical Abstracts Society Web (JMASWeb). No related paper was found in PubMed, whereas we found 4 proceedings of conference in JMAS-Web (in Japanese), but no paper. Furuya and colleagues reported the manufacture of an instrument that had a round circumferential end and 4 half-circled depressions to reduce tissue injury. Tani and colleagues reported an instrument that had a polyamide brush end of 120 to 240 pieces, 1.0 to 1.5 cm in length, which did not suck to injure organs. However, these forms and principles were not similar to our device. Therefore, we believe our device to be a new technique.

We studied the optimum length and pieces of the divided silicone drain tip. The length of the arms could be between 1.0 and 1.5 cm, but 1.2 cm is optimum. Too short

arms led to absorption of fatty tissue from the end. Too long arms led to weakened firmness to block fatty tissue and led to adsorption from the long opening. The 4 pieces of arms were optimum. Two arms were attached together in sucking. Six arms were a little bit difficult to be divided equally, and also had weakened firmness to block fatty tissue.

Our device is made up of 100% silicon; it is flexible and has many fine vertical ditches at the inner side. These ditches facilitated drainage and increased the tenacity of the arms to block fatty tissue at suction. Even if it is lost in the abdomen, it can be detected with its x-ray impermeable marker.

Herein, we report the use of a new device made up of a divided silicone drain tip. This simple, easy, and inexpensive technique facilitated the prevention of irregular adsorption of fatty tissue while using an irrigation-suction instrument for laparoscopic surgery.