Journal of Pediatric Surgery Case Reports 21 (2017) 29–32

Contents lists available at ScienceDirect

Journal of Pediatric Surgery Case Reports

journal homepage: www.jpscasereports.com

Preoperative computed tomography-guided marking is useful for intraoperative identification of a tiny intraabdominal recurrent lesion of pancreatoblastoma

Tetsuya Ishimaru [a], Jun Fujishiro, MD, PhD [a, *], Masahiko Sugiyama [a], Mari Arai [a], Kaori Satoh [a], Chizue Uotani [a], Masataka Takahashi [a], Shohei Takami [a], Jiro Sato [b], Junko Takita [c], Tadashi Iwanaka [d]

[a] Department of Pediatric Surgery, The University of Tokyo Hospital, 7-3-1 Hongo, Bunkyo, Tokyo 113-8655, Japan
[b] Department of Radiology, The University of Tokyo Hospital, 7-3-1 Hongo, Bunkyo, Tokyo 113-8655, Japan
[c] Department of Pediatrics, The University of Tokyo Hospital, 7-3-1 Hongo, Bunkyo, Tokyo 113-8655, Japan
[d] Saitama Children's Medical Center, 1-2 Shintoshin, Chuo-ku, Saitama 330-8777, Japan

ARTICLE INFO

Article history:
Received 23 March 2017
Received in revised form
9 April 2017
Accepted 11 April 2017
Available online 18 April 2017

Keywords:
CT-guided marking
Children
Abdominal recurrent tumor
Small lesion

ABSTRACT

Preoperative computed tomography-guided marking is commonly performed for peripheral small lung lesions but rarely for abdominal tumors. This technique was useful for intraoperative identification of a tiny abdominal recurrence in a patient with ruptured pancreatoblastoma in remission. We report the case especially focusing on the technical aspect of the procedure.

© 2017 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

1. Introduction

Preoperative computed tomography (CT)-guided marking is often performed for small and impalpable pulmonary nodules in video-assisted thoracoscopic surgery, and several techniques have been developed to localize the lesion intraoperatively [1]. However, there is no report on its application in abdominal surgery. We herein report a patient with a tiny abdominal recurrent lesion of pancreatoblastoma and preoperative CT-guided marking was useful for intraoperative identification of the lesion during tumorectomy.

2. Case

A 5-year-old boy whose chief complaints were vomiting and abdominal pain, was found to have a large abdominal mass on computed tomography (CT) and was admitted to a hospital. On the next day, he underwent emergency surgery due to rupture of the tumor. The intraoperative diagnosis was pancreatoblastoma and retroperitoneal tumor resection concurrent with distal pancreatectomy was performed. Local recurrence and multiple liver metastases, which were identified two months after the operation, were not controllable despite chemoradiation and palliative care was recommended. He was referred to our hospital at the age of 6 years and 11 months for a second opinion.

At our hospital, he underwent tandem high-dose chemotherapy with autologous peripheral blood stem cell transplantation (auto-PBSCT). As a result, the size of the local recurrence decreased and no new lesions were identified. Laparotomy for volume reduction was performed and the local recurrence was completely removed without any intraoperative intervention for multiple liver metastases. Liver metastases progressed postoperatively, but a second tandem high-dose chemotherapy with auto-PBSCT followed by resection of the right and caudate lobes of the liver produced remission and he was discharged at the age of 7 years and 7 months.

* Corresponding author.
E-mail address: jfujishi-tky@umin.ac.jp (J. Fujishiro).

http://dx.doi.org/10.1016/j.epsc.2017.04.006
2213-5766/© 2017 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

Four months after discharge, follow-up imaging studies including CT (Fig. 1), magnetic resonance imaging (MRI), and positron emission tomography (PET) showed right cardiac lymph node swelling and a small mass at the posterolateral region of the left kidney. Both of them were considered to be recurrences and laparotomy was performed at the age of 8 years. The metastatic node was removed, but the small mass could not be identified despite careful intraoperative examination, and postoperative CT revealed that the lesion was in the same location. Reoperation following CT-guided marking was planned.

Under general anesthesia, he was placed in the prone position on the CT table and a radio-opaque guide was attached on the surface of his lower back (Fig. 2a). CT images of the mass and the guide were taken and a puncture line was planned. The puncture point was marked on the patient's skin with an oily pen and the skin was sterilized. A needle guide held by a radiologist was pressed on the puncture point and the angle of the guide was reconfirmed on another CT scan. Then, puncture with a 22 G intravenous catheter (Surflo Flash; Terumo, Japan) was performed by the radiologist who was careful not to directly puncture the lesion which might cause dissemination of the tumor. After checking the position of the needle tip by CT scanning, 0.5 mL of a dye, which was a mixture of 5 mL of indocyanine green, 1 mL of ethiodized oil, and 1 mL of lidocaine hydrochloride jelly, was injected close to the mass. Then, the patient was moved to the operative theater and placed in the supine position. On laparotomy, we carefully examined the intra-abdominal region and found the injected dye in the retroperitoneal space on the posterolateral side of the left kidney (Fig. 3). The mass was identified cephalad to the stained area and was removed completely. Pathological findings were compatible with recurrence of pancreatoblastoma and the size of the tumor was 20 × 10 × 10 mm. After chemoradiation, he achieved second remission and was discharged at the age of 8 years and 2 months.

Three months later, liver metastasis was identified and high-dose chemotherapy with cord blood transplantation followed by enucleation of the liver metastasis was performed. At the age of 8 years and 11 months, a small recurrent mass (less than 1 cm) was observed at the caudal region of the spleen on follow-up MRI (Fig. 4a) and PET. However, this mass was not visible on CT images (Fig. 4b) and it was expected that it would be difficult to find this small mas intraoperatively. Therefore, preoperative marking was planned. The detailed technique using the dye was the same as that described above, but a guiding marker system, which was a needle loaded with a stainless steel bar attached at the end of a nylon thread that is often used for marking peripheral lung lesions (Hakko Co., Ltd. Medical Device Division, Nagano, Japan), was also used to be able to identify the mass. Injection of the dye and placement of the marker were performed under CT guidance at the estimated location of the recurrent mass based on the MRI images. Immediately after being transferred to the operative theater, fluoroscopic examination revealed that the dye had disappeared but the marker was left in place. The mass was found on the surface of the right diaphragm using the marker and thread for guidance, and was resected along with the diaphragm. The size of the tumor was 11 × 8 × 7 mm and pathological findings were compatible with metastatic pancreatoblastoma.

The patient is currently 10 years old and continues chemotherapy for liver and left renal gland metastases.

Fig. 1. Target lesion of the first marking. A small recurrent lesion (arrow) was found by follow-up CT at the posterolateral region of the left kidney.

3. Discussion

Preoperative CT-guided marking was useful for intraoperative identification of a tiny abdominal recurrent lesion and its techniques were described in detail. The lesion, that was resected following the second marking, had been visible on MRI images but not on CT images. Advancement of imaging technology might enable detection of minute lesions and the lesions may be invisible with the naked eye during surgery. Adaptation of an augmented reality navigation system was reported to be useful [2,3], but it is still in the research stage. Therefore, our method, which was previously used to mark deep impalpable pulmonary nodules [4] and was applied to a tiny abdominal lesion, is easy to perform and can be used in clinical practice.

Various materials such as lipiodol, metallic coil, hook wire, dye and barium have been introduced for preoperative CT-guided marking of impalpable pulmonary nodules [1]. As for dye injection, the timing of injection is critical and depends on which dye is chosen. The current dye which consisted of a mixture of indocyanine green, ethiodized oil, and lidocaine hydrochloride jelly reportedly remained in place and was useful for intraoperative identification of pulmonary nodules 60–80 min after injection [4]. The color of indocyanine green was easy to find in the body and lidocaine hydrochloride jelly was added with the expectation of localization of the dye without diffusion. Upon injection of ethiodized oil alone, it remained in place for a few days [1], and we could use intraoperative fluoroscopic examination to detect the dye by adding this material. However, the optimal timing of injection to mark an abdominal lesion is unknown, as there is no report of CT-guided marking in abdominal surgery. The time from injection of dye to operation start was 50 and 77 min, respectively. The injected dye remained in place and was found intraoperatively during the first procedure, but preoperative fluoroscopic examination, which was performed 60 min after dye injection, did not reveal the dye and we could not find the dye during the second procedure. The dye seemed to have diffused in a short period of time.

The combined use of dye injection and guiding marker placement is a more secure method and is not time-consuming as the procedure time of the second marking was 28 min including the duration of marker placement (5 min). As for the guiding marker system, complications such as pneumothorax, hematothorax, and air embolism were introduced in respiratory surgery [5–8]. In the current case, there was a risk that the needle could pass through the thoracic cavity but the possibility that the needle penetrates the lung seemed to be extremely low. As a result, guiding marker placement was performed without any complications and was useful for detection of the target.

Download English Version:

https://daneshyari.com/en/article/8811282

Download Persian Version:

https://daneshyari.com/article/8811282

Daneshyari.com