

## Thoracoabdominal wall tumour seeding after percutaneous radiofrequency ablation for recurrent colorectal liver metastatic lesion : a case report with a brief literature review

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### Abstract

Radiofrequency is a safe and effective minimally invasive procedure in the treatment of liver and other organs neoplastic lesions. Percutaneous access of neoplastic liver tissue is the most common access and electrodes are placed with imaging guidance into the tumour to be ablated. Complications during and after radiofrequency ablation (RFA) are of major or minor severity. Tumour dissemination related to the percutaneous access seems to be very unusual. Herein, we present a rare case of thoracoabdominal tumour wall dissemination after RFA of a recurrent hepatic colorectal metastasis previously removed by surgery. A 64-year-old man with a recurrent hepatic metastatic lesion was treated with internally cooled radiofrequency (RF) for ablation of a 3x3cm in size tumour mass. Two sessions of RFA in one-month period were performed. Computed tomography (CT) of the upper abdomen and carcinoembryonic (CEA) antigen were used for estimation of the disease progression in the patient's follow-up. Ten months after RFA the patient presented abdominal pain and a mass appeared on the right thoracoabdominal area with simultaneous lung metastases. In conclusion, a large size, bulky and superficial mass on the liver parenchyma adjacent to the thoracoabdominal wall as well as multiple RFA sessions, seem to represent risk factors for tumour dissemination through the needle electrode used during the RFA procedure in hepatic metastases of colorectal cancer. (*Acta gastroenterol. belg.*, 2006, 69, 239-242).

**Key words** : radiofrequency ablation, liver metastases, colorectal cancer.

### Introduction

Colorectal cancer is one of the most frequent malignancies ; most of these patients die because of hepatic metastases. Among patients with hepatic metastases only a few of them are candidates for surgical resection. At present, in patients with primary or secondary hepatic tumours who can not undergo surgery, attention is given to the use of thermal energy sources for tumour ablation, like radiofrequency (RF) (1), microwave (2) and laser energy (3). These therapies reduce the number of treatment sessions required for tumour regression compared to percutaneous ethanol injection (PEI). They can be used alone or in combination with regional and/or systemic chemotherapy. Image-guided percutaneous therapy with RF ablation (RFA) is a mainstay in the treatment of small size primary or secondary hepatic tumours and RF thermal ablation leads to frictional generation (80-100°C) resulting in tissue death. The device is comprised of a needle through which an array of wires

is exited and monitors the progress of the ablation ball. The passage of alternating high-frequency current, greater than 10 kHz through tissue, leads to a rise in temperature and alternating electric field set up in the tissue displaces molecules first in one direction and then in the opposite. This, so-called dielectric loss, is the molecular basis of tissue ablation by radiofrequency energy (4).

Complications of the method are mentioned presenting with major or minor severity. The method is characterized quiet safe and effective, rapidly gaining acceptance in surgical and radiological community. Iatrogenic seeding along the track of the probe used during tumour ablation, seems to be a theoretical complication rarely mentioned in cases of large size, inoperable hepatocellular carcinomas with the needle biopsy of the hepatic tumour done before RFA consisting a significant risk factor. Herein, we report a rare case of recurrent hepatic metastasis after surgical excision of hepatic metastatic lesions. The RFA was the main treatment complicated with thoracoabdominal dissemination without any needle biopsy proceeding through the thoracoabdominal wall.

### Case report

A 62 years old man was treated by surgery because of a cecum carcinoma. A right hemicolectomy was performed, while two hepatic metastases of 2 × 2 cm in size each in the segments VI and VII, respectively were surgically excised. The postoperative care did not appear any complications and the patient was under treatment with adjuvant chemotherapy. The preoperative serum levels of carcinoembryonic antigen (CEA) were 48 ng/ml and decreased near the normal levels (8 ng/ml) after 6 months. Eighteen months after surgery during the follow-up, a slight increase of CEA was ascertained (24 ng/ml) and the abdominal computed tomography

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Fig. 1. — RFA of the recurrent hepatic metastasis through the 7th right intercostal space.



Fig. 2. — Cavernous site after RFA, tumor mass near the thoracoabdominal area.

(CT) scan showed a recurrent lesion of 3 cm in the liver segment VI. No other metastatic lesions were found in the abdomen and chest cavity. Patient rejected a new surgical treatment for the recurrence of the hepatic metastatic lesion and agreed for percutaneous RFA of the hepatic lesion and chemotherapy. Two sessions of cooled-tip RFA into a month were performed (Fig. 1) and a cavernous site in the destructed neoplastic tissue was developed (Fig. 2). CEA serum levels decreased at 18 ng/ml. Ten months later the patient presented episodes of pain periodically on the right lower anterior chest and right hypochondrium, expanded to the periumbilical area with a hard mass appearing at the right thoracoabdominal area. Patient was admitted in the hospital. Physical examination showed a hard, painful, fixed and large mass, 7 × 8 cm in size at the anterior lower thoracoabdominal wall (Fig. 3). Colonoscopy revealed no findings. Chest CT scan and upper abdominal magnetic resonance imaging (MRI) revealed lung metastases and a secondary tumour location on the abdominal wall at the



Fig. 3. — A bulky, painful and hard tumor mass on the right thoracoabdominal area.

site of RFA (Figs. 4, 5). Serum CEA level was increased to 886 ng/ml. The case was characterized as inoperable by the oncology committee of the hospital and treatment with chemotherapy agents was recommended.

## Discussion

Surgical resection of hepatic metastases is the treatment of choice in most patients suffering from colorectal cancer with simultaneous liver metastases (5). However, only 20% of those patients are candidates for resection despite advancements established in hepatic surgery. Other therapies like neoadjuvant chemotherapy (6), preoperative portal vein embolization and hepatic intra-arterial injection (7,8), and two-stage resection approaches may increase the number of patients who can undergo a curative surgical treatment (9). If complete resection is not possible, due to the disease extent or severe liver dysfunction and comorbidity subsequently direct radiofrequency ablation of the hepatic metastases is one of some available options (10) provided intraoperatively or percutaneously. This technique is safe, feasible with good results (11,12). Percutaneous RF may be performed with local anesthesia under sedation without admission of the patient in the hospital. Thermal ablation with radiofrequency energy is used as treatment in a variety of neoplasms including hepatocellular carcinoma (13,14), secondary liver tumours (15-17), renal cell carcinoma (18), breast tumours (19), metastatic cancer of the thyroid gland (20), osteoid osteoma (21), painful osseous metastases (22) and parathyroid hyperplasia as well (23).

Complications and side effects related to RFA of hepatic metastatic lesions are rare with their percentage ranging from 0% to 7% (24). In a recent multicenter study, complications encountered as major were of 2.2%



Fig. 4. — Upper abdominal CT scan, showing a large tumor mass located on the right thoracoabdominal wall and liver.

in 2.320 patients (25). A complication is characterized as major, if untreated threatens patient's life, leads to substantial morbidity and disability or results in a lengthened hospital stay. These major complications do not require a surgery approach. All other complications are regarded minor or represent side effects of the technique. The most common major complications that occur during the periprocedural time, are intraperitoneal bleeding requiring therapy, intrahepatic abscesses, gastrointestinal tract perforation, hemothorax, biloma, biliary stricture, cardiac arrest and pulmonary embolism.

A delayed (4-18 months after RF therapy), rare and major complication is tumour seeding along the track of the initial electrode insertion suggesting an iatrogenic dissemination due to the procedure. It seems that the frequency of tumour seeding is not more than 0.5-0.9% in patients after percutaneous cooled tip radiofrequency ablation. In high risk to this complication, are patients suffering from hepatocellular carcinoma, patients who had undergone needle biopsy, patients with subcapsular tumour location, poorly differentiated tumours and high serum levels of  $\alpha$ -fetoprotein (26). In a large study dealing with RFA for colorectal hepatic metastases and long-term follow-up, no tumour seeding was mentioned (16). In another large multicenter study only two cases with colorectal liver metastases and seeding after RFA were reported; however, there was an association with a previously taken place biopsy (25).

In the case reported, herein, the patient had a mucoid, grade II differentiated adenocarcinoma of the cecum, Dukes D stage. After surgery no abnormal findings were found in the first and second follow-up, 6 and 12 months later, respectively. In the third follow-up a recurrent mass 3 × 3 cm in size, in the segment VI was detected. The mass was located subcapsularly adjacent to the thoracoabdominal wall. The size of the mass was considered as quite large, therefore two sessions of RFA



Fig. 5. — MRI showing the thoracoabdominal and hepatic location of the tumor mass.

were performed. It seems that better outcomes are obtained with smaller tumours, so in tumours less than 2.5 × 2.5 cm in size a local control may be achieved in 78% of the cases. Larger tumours with 2.6-4 cm in diameter are controlled in 47% of the cases. When tumour size is more than 4 cm the percentage decreases to 32% (16). Ten days after RFA, the upper abdomen CT scan showed a zone of hepatic necrosis in a sharply demarcated hypoattenuated area. According to Scudamore et al, effective ablation is the destruction of tumour within the zone of ablation rather than necrosis of the entire lesion (27). In addition, complete necrosis is not achieved in all cases (28). It must be mentioned that CEA serum levels never return to normal levels after RFA.

A local recurrence in the liver was diagnosed 10 months after RFA, with the tumour expanding through the track of the needle electrode at the right thoracoabdominal wall. The case was characterized as inoperable since lung metastases were detected in the right lung. To our best knowledge, the case reported herein, is the first one describing RFA as alternative treatment in a recurrent hepatic metastasis 18 months after surgical resection of hepatic metastases. It seems that large size hepatic metastases with subcapsular location adjacent to the abdominal wall, and multiple sessions of RFA must be considered as risk factors in tumour seeding through the needle electrode during RFA procedure. Thus, an intense follow-up must be performed the 1<sup>st</sup> year after RFA since the majority of recurrences appear in that period (29).

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