



## Scientific letters

## Complete Ischemic Necrosis of Segment IV After Radiofrequency Ablation With Hilar Clamping<sup>☆</sup>

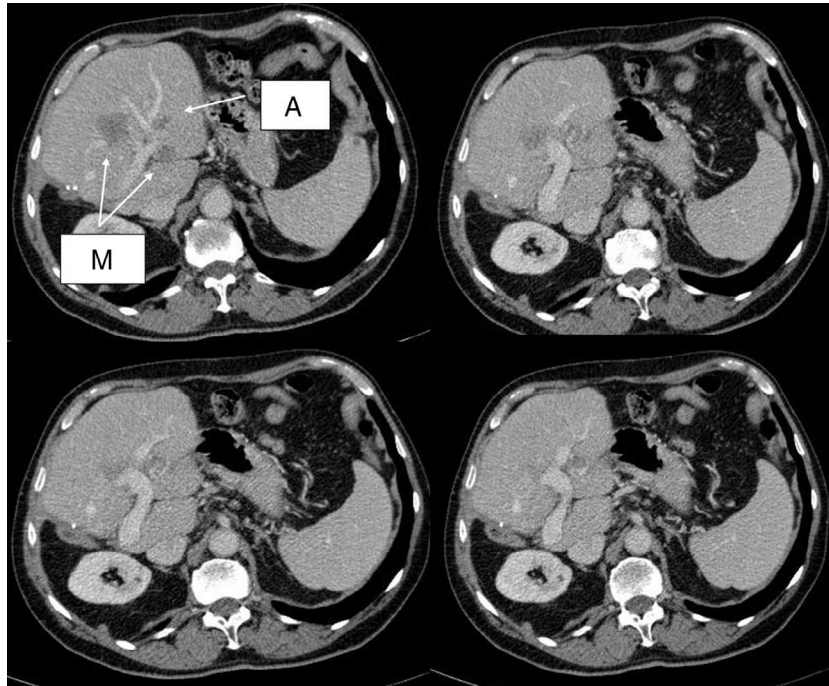


### Necrosis isquémica completa del segmento IV tras ablación con radiofrecuencia con clampaje hilar

Radiofrequency ablation of liver metastases is an alternative to surgical resection when the use of this technique is not possible. It is generally a safe technique that provides good results in the treatment of lesions smaller than 3 cm.<sup>1</sup> One of its limitations is its reduced effectiveness when these lesions are close to blood vessels due to the cooling effect that it causes in blood circulation. For this reason, when it is applied

intraoperatively, hilar clamping is recommended to reduce this effect. In the case we present, radiofrequency ablation of a central metastasis with hilar clamping led to complete ischemic necrosis of a liver segment.

The patient is a 72-year-old male with a history of colon cancer and synchronous liver metastases that had been resected by means of right hepatectomy 14 months earlier.



**Fig. 1** – Initial CT scan showing the metastasis in segment IV in contact with the left portal vein and encompassing the portal branch of the segment, one of the metastases in segment II (M) and an angioma (A).

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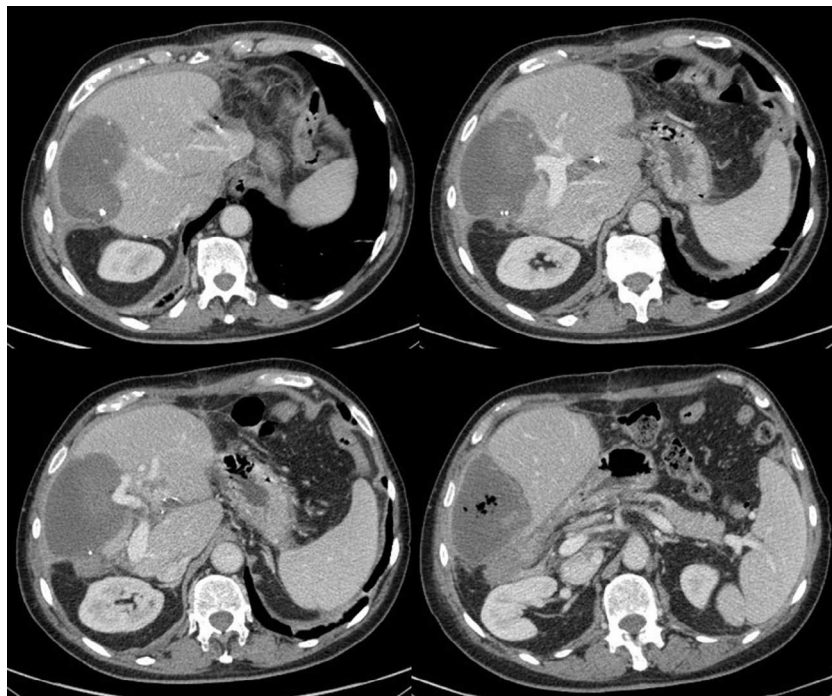
During follow-up, 3 new metastases were detected: 2 superficial lesions in segment II, and 1 deep lesion measuring 2 cm in segment IV, which was in contact with the left portal vein and encompassed branches of this segment (Fig. 1). The location made surgical resection impossible. We considered the possibility of R0 treatment using combined surgery and radiofrequency ablation. In a multidisciplinary clinical session, treatment with 4 cycles of neoadjuvant FOLFIRI-cetuximab was decided. Re-evaluation with CT and MRI showed a partial response with no extrahepatic metastases.

The patient underwent surgery, involving individual non-anatomical resections of the metastases in segment II and radiofrequency ablation of the metastasis in segment IV. We used the Cool-tip™ RF Ablation System by Covidien with a needle whose radius of action was 3 cm, and radiofrequency was applied with hilar clamping for 11 min. The postoperative period was uneventful; transaminase levels were initially elevated (GOT/GPT=1505/1373 IU/L; GGT/FA=241/128 IU/L), then progressively descended, and liver function was normal. The patient was asymptomatic and discharged on the 7th day post-op. On the 12th day post-op, the patient was readmitted with fever. Lab workup showed normal liver function (GOT/GPT=59/161 IU/L and GGT/FA=1213/726 IU/L) and normal bilirubin. CT detected a collection that occupied the entire segment IV, with dense content and air bubbles and no arterial or venous contrast material (Fig. 2). Needle aspiration obtained a small amount of serosanguineous fluid that was sent for culture, which ruled out the presence of biliary content. Both this culture and the blood cultures were negative. The clinical-radiological diagnosis was complete ischemic necrosis of segment IV. The patient was treated with empirical antibiotics and antipyretics, after which he presented good clinical progress. The patient was discharged after 6 days with oral antibiotic therapy (the patient's residence was in another

province, which made early discharge difficult). In spite of the complication described, the treatment was effective and there was no evidence of disease 6 months afterwards.

Although radiofrequency ablation of liver metastases is a rather safe procedure, it does have its complications. These are more frequent when the procedure is percutaneous than when the application is intraoperative due to the greater control of the pathway of the needle and the neighboring organs in this latter situation. For this reason, we prefer its intraoperative application, which also enables hilar clamping in order to improve its efficacy. Reported complications of radiofrequency include abscesses, bilomas, biliary fistulas, sepsis, portal thrombosis, etc.<sup>2</sup> We have not found any published cases with ischemic necrosis of an entire segment. Portal thrombosis is more frequent in cirrhotic patients and it has been associated with procedures with vascular occlusion and a distance of less than 5 mm to the vessel.<sup>3,4</sup> The cause of the thrombosis is the heat-generated endothelial damage.<sup>2</sup> Nonetheless, in a recent study, hilar clamping was not associated with a greater incidence of major complications,<sup>5</sup> and its application in metastases close to hepatic veins with hilar and corresponding hepatic vein clamping was also safe.<sup>6</sup> In cases with portal thrombosis, although it may cause liver failure, it does not lead to ischemic necrosis of the parenchyma as it is substituted by the corresponding hepatic artery.<sup>7</sup>

In our case, in addition to portal thrombosis, there must have been arterial thrombosis of the branch from segment IV that led to complete ischemic necrosis of the segment. In our patient, the liver parenchyma of segments I, II, and III was sufficient to maintain normal liver function. Nevertheless, the consequences could have been severe, so this complication, although uncommon, should be considered in similar cases and other ablative techniques should be contemplated.



**Fig. 2 – Postoperative CT scan showing necrosis of the parenchyma of segment IV and lack of contrast in portal branches of this segment.**

## REFERENCES

1. Minami Y, Kudo M. Radiofrequency ablation of liver metastases from colorectal cancer: a literature review. *Gut Liver*. 2013;7:1-6.
2. Razafindratsira T, Isambert M, Evrard S. Complications of intraoperative radiofrequency ablation of liver metastases. *HPB (Oxford)*. 2011;13:15-23.
3. Frich L, Hol PK, Roy S, Mala T, Edwin B, Clausen OP, et al. Experimental hepatic radiofrequency ablation using wet electrodes: Electrode-to-vessel distance is a significant predictor for delayed portal vein thrombosis. *Eur Radiol*. 2006;16:1990-9.
4. Mulier S, Mulier P, Ni Y, Miao Y, Dupas B, Marchal G, et al. Complications of radiofrequency coagulation of liver tumours. *Br J Surg*. 2002;89:1206-22.
5. Desolneux G, Vara J, Razafindratsira T, Isambert M, Brouste V, McKelvie-Sebileau P, et al. Patterns of complications following intraoperative radiofrequency ablation for liver metastases. *HPB (Oxford)*. 2014. <http://dx.doi.org/10.1111/hpb.12274> [Epub ahead of print].
6. Evrard S, Brouste V, McKelvie-Sebileau P, Desolneux G. Liver metastases in close contact to hepatic veins ablated under vascular exclusion. *Eur J Surg Oncol*. 2013;39:1400-6.
7. Kim AY, Rhim H, Park M, Lee MW, Kim YS, Choi D, et al. Venous thrombosis after radiofrequency ablation for hepatocellular carcinoma. *Am J Roentgenol*. 2011;197:1474-80.

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## Omental Infarction: Surgical or Conservative Management?☆



### Infarto omental: ¿manejo quirúrgico o conservador?

Omental infarction (OI) is a rare cause of acute abdomen.<sup>1</sup> The inclusion of the latest radiological advances in standard clinical practice leads one to question the classical surgical management of this disease.<sup>2</sup> We present a review of patients who were hospitalized with OI at our hospital in the last 10 years (6 cases) (Table 1), 3 of whom were treated surgically.

The patients who were treated conservatively were diagnosed with OI by computed tomography (CT), with no pathology diagnosis. One patient was readmitted 1 week after discharge due to worsened clinical condition, which required another CT scan and colonoscopy to rule out an underlying disease. All patients received analgesic, anti-inflammatory and antibiotic treatment, which has also been proposed by other authors,<sup>1,2</sup> although antibiotic treatment has been disputed in other cases.<sup>3,4</sup> After clinical improvement, patients were discharged from hospital after 5, 9 and 11 days, respectively. Two years later, the patients continue to be asymptomatic and annual follow-up CT scans show reduction of the inflammatory mass<sup>3,4</sup> as well as the absence of any other omental lesions.<sup>1,5</sup>

In the patients who were treated surgically, there was no preoperative diagnosis of OI. In 2 cases, surgery was indicated due to suspicion of acute appendicitis, and in one case due to

suspicion of tubo-ovarian abscess. In these 3 cases, the diagnosis of OI was confirmed during surgery. In all patients, the affected omentum was resected along with the appendix in order to avoid future errors in diagnosis.<sup>2,5,6</sup> The hospital stays were 2, 4 and 4 days, respectively, and there were no postoperative complications. Patients were seen one month after surgery and were asymptomatic.

According to the classification proposed by Leitner et al., OI are defined as either primary or secondary depending on their pathogenesis.<sup>7</sup> They can be secondary to torsion caused by adhesions, cysts, tumours or hernias, or thrombotic processes due to hypercoagulation disorder, vascular anomalies or trauma (as in our third case). Cases with no discernible cause are considered primary OI, which is the most frequent aetiology, as seen in 5 of our patients. Predisposing factors include obesity, local trauma, excessive eating or cough.<sup>5</sup>

Within the nonspecific symptoms, there is a predominance of progressive pain in the right hemiabdomen.<sup>2</sup> Our 6 cases debuted with symptoms that were compatible with acute abdomen. In general, nausea, vomiting, anorexia or other gastrointestinal signs are absent. This type of presentation should pose a differential diagnosis with cholecystitis, diverticulitis, epiploic appendagitis, tumours displaying fat

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