



# **Role of Interventional Radiology in management of Colorectal Cancer Liver Metastases**

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of the Master Degree in Radiodiagnosis*

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# Introduction

Worldwide incidence of colorectal cancer (CRC) is approximately 400,000 patients. Sixty percent of these patients will develop liver metastases, with the liver being the second most common site of disease after lymph nodes and the most common site of refractory progression. In approximately 35% of patients with CRC, metastases are confined to the liver. The survival rates for patients with liver metastases from CRC are improving, but 5-year survival is still only approximately 19.2%. **(Narayanan et al, 2013)**

Surgical resection of the affected portion of the liver offers the best chance for disease-free and overall survival. Unfortunately, most patients present with disease that is not amenable to resection or have other contraindications to surgery. It is estimated that only 15-30% of patients are surgical candidates at initial disease presentation. **(Narayanan et al, 2013)**

For patients who do not undergo surgery, survival rates are disappointing, with 5-year survivals less than 25%. **(Fiorentini et al, 2014).**

Recent advances in hepatic-directed therapy in the setting of liver metastasis for metastatic colorectal cancer have been published. **(Martin et al, 2015).**

According to a variety of tumor locations, liver function and different responses to systemic or loco-regional chemotherapy, ablative therapies, such as Radiofrequency ablation and Microwave ablation have been used in the management of patients with Colorectal cancer liver metastases. **(Vogl et al, 2014).**

Thermal ablation may be an appropriate alternative in patients with Colorectal cancer liver metastases who have inoperable liver lesions or have operable lesions as an adjunct to resection. **(Vogl et al, 2014)**

For many patients with Colorectal cancer liver metastases, complete surgical resection of the metastases requires extended right hepatectomy. Portal vein embolization is an effective strategy for

producing hypertrophy of the Future Liver Remnant and improving the safety of extensive liver resection. This technique has allowed many patients whose tumours were initially unresectable because of small Future Liver Remnant volume to benefit from curative resection (***Shindoh et al, 2013***).

Transarterial chemoembolization has been shown to deliver high-dose chemotherapy directly to target lesions within the liver with minimal systemic side-effects. This technique, which has largely been used in the treatment of hepatocellular carcinoma, has expanded into treatment of liver-dominant metastatic disease. Recent data has suggested that TACE has the potential both to accentuate the palliation and potentially to improve quality of life in patients with Colorectal cancer metastatic to the liver. (***Narayanan et al, 2013***)

The use of Drug Eluting Beads (DEBs) which can be loaded with irinotecan, a chemotherapeutic agent, allows drug release after the DEBs are trapped in the tumoral circulation, and was first reported for the treatment of colorectal cancer liver metastases in 2006. (***Richardson et al, 2013***).

Drug Eluting Beads with Irinotecan (DEBIRI) is safe and well tolerated, thereby offering patients an improvement in their quality of life. (***Narayanan et al, 2013***)

DEBIRI can provide a median survival equivalent to that associated with standard systemic chemotherapy, and may also be useful in downstaging unresectable colorectal cancer liver metastases to resectable status with minimal toxicity and acceptable cost. (***Richardson et al, 2013***)

Radioembolisation using yttrium-90 (<sup>90</sup>Y)-bound resin microspheres as the local radiation source is a form of intra-arterial brachytherapy for liver-dominant metastatic colorectal cancer which is characterized by high disease control rates of  $\geq 90\%$  when applied as a first or second line associated with chemotherapy and 52–72 % in the salvage setting. (***Golfieri et al, 2015***).

<sup>90</sup>Y-Radioembolization is safe and effective in patients with colorectal cancer liver metastases who were heavily pre-treated and refractory to

standard-of-care systemic chemotherapy. It can also be considered, even in this end-stage population, as a bridge therapy to subsequent treatments including surgical resection and ablation. (***Golfieri et al, 2015***)



# **Aim of work**

To elaborate the growing role interventional radiology plays in the management of patients with colorectal cancer liver metastases and discuss the different curative and palliative options that are made available to these patients by interventional radiologists.



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