Publications on the Clinical Use of SIR-Spheres® microspheres

Since the first experimental patients were treated in the late 1980s, numerous reports detailing the use of SIR-Spheres microspheres have appeared in the literature. These papers have been from a variety of clinical trial and experiential settings and are presented here as a bibliography in different tumour types and in chronological order (latest first). In addition, the interim results of other studies that have as yet only been presented at scientific meetings are provided separately in each tumour type.

Review articles, technical papers and books or chapters on selective internal radiation therapy (SIRT) or radioembolisation that are useful sources of information on areas related to treating patients with SIR-Spheres microspheres are also listed, again in chronological order in each section.

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Sirtex Medical Limited
Level 33, 101 Miller Street
North Sydney NSW 2060
Australia
Phone: +61 2 99 64 8400
Email: info@sirtex.com

Sirtex Medical Singapore Pte Ltd
50 Science Park Road
#01-01 Science Park II
Singapore 117406
Phone: +65 6308 8370
Email: info@sirtex.com

Sirtex Medical Europe GmbH
Walter-Flex Straße 2,
D-53113 Bonn, Germany
Phone: +49 228 18 407 30
Email: info@sirtex-europe.com

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Colorectal Cancer Liver Metastases

Prospective Clinical Studies in Colorectal Cancer Liver Metastases


Abstracts on Prospective Clinical Studies in Colorectal Cancer Liver Metastases


Sofocleous CT, Kemeny NE, Pandit-Taskar N et al. Phase I trial of yttrium 90 resin microspheres in the treatment of colon cancer liver metastases progressing despite hepatic arterial as well as systemic chemotherapy: Preliminary results. ASCO Gastrointestinal Cancers Symposium 2012; Abs. 625.


Rose SC, Roeland E, Shimabukuro K et al. Single center prospective phase II trial of yttrium-90 radioembolization for treatment of colorectal liver metastases that have failed first line chemotherapy and prior to initiation of second line chemotherapy: study design and early results. Cardiovascular and Interventional Radiology in Europe (CIRSE) 2011; Abs. 1306.4.


Retrospective Studies in Colorectal Cancer Liver Metastases


Chua TC, Bester L, Akther J, Morris DL. Successful right hepatectomy after four treatments of yttrium-90 microspheres (SIR-Spheres(R)) and concomitant FOLFOX as bridging therapy to resection of colorectal metastases. Anticancer Research 2010; 30: 3005–3007.


**Abstracts on Retrospective Studies in Colorectal Cancer Liver Metastases**

Kennedy AS, Ball D, Cohen SK et al. Safety and efficacy of 90Y resin microspheres in elderly (≥70 years) compared to younger patients with colorectal liver metastases (mCRC). *ASCO Annual Meeting* 2013, *Journal of Clinical Oncology* 31 (Suppl): Abs. e14545.


Schoen M, Kant D, Dietrich J et al. Selective internal radiation therapy (SIRT) prior to liver resection for colorectal liver metastases. *International Hepato-Pancreato-Biliary Association Congress* 2012; Abs. C443.

Coldwell D, Schacht M, Sharma V. Differential response to radioembolization for colorectal cancer metastases to the liver in KRAS mutant patients. *World Conference on Interventional Oncology (WCIO) meeting* 2012; Abs. 48.


Grabowski SF, Nichols EM, Kudryasheva S et al. The efficacy of selective internal radiation therapy (SIRT) with yttrium-90 (Y90) is enhanced when given in low volume disease and in conjunction with other liver-directed therapies. *53rd Annual Meeting of American Society for Radiation Oncology (ASTRO), International Journal of Radiation Oncology, Biology and Physics* 2011; 81 (2 Suppl): S353–S354 Abs. 2296.


Paprottka PM, Hoffmann RT, Trumm CG et al. 90Yttrium-radioembolization of chemotherapy-refractory colorectal cancer liver metastases. *World Conference on Interventional Oncology (WCIO) meeting* 2011; Abs. 52.


Sanro B, Chopitea A, Rodriguez J et al. Radioembolization using Y90-labeled resin microspheres (Y90-RE) as consolidation treatment after 1st-line chemotherapy (CxB) for liver metastases from colorectal cancer (CRC). ASCO Gastrointestinal Cancers Symposium 2010; Abs. 250.


Kennedy AS, Kreuk P, Jakobs T, Dezarn WA. Effects of anti-angiogenic therapy and chemotherapy on 90Y-microsphere treatment of colorectal liver metastases. 20th International Congress on Anti Cancer Treatment (ICACT) 2009; Abs. IC/AB159.


Kennedy A. Long-lived complete responders following radioembolization: Does this challenge the orthodox belief of disease progression? 2nd European Symposium on Liver-Directed Cancer Therapies using Microspheres February 2008.

Stubbs R, O’Brien I, Correia M. Selective internal radiation therapy for colorectal liver metastases: single-centre experience with 100 patients. 7th World Congress of the International Hepato-Pancreato-Biliary Association (IHPBA 2006); Abs.

Murthy R, Habbu A, Richey S et al. Implications of patterns of metastases of mCRC on liver directed therapy in patients undergoing combination systemic treatment with irinotecan and cetuximab. World Conference on Interventional Oncology (WCIO) meeting 2006; Abs. 8130.

Rivet M. Monitoring 90Y-SIR-Sphere treatment response with 18FDG-PET. 36th Annual Scientific Meeting of the Australian and New Zealand Society of Nuclear Medicine April 2006; Abs. 14.


Hepatocellular Carcinoma

Prospective Clinical Studies in Hepatocellular Carcinoma


Abstracts on Prospective Clinical Studies in Hepatocellular Carcinoma


Retrospective Studies in Hepatocellular Carcinoma


Wigg A. Yttrium 90 therapy for HCC; is it any better than conventional external beam radiotherapy? *Hepatology* 2012; 55: 981.


**Abstracts on Retrospective Studies in Hepatocellular Carcinoma**


Rana N, Ju AW, Bazylewicz M et al. Yttrium-90 radioembolization is safe in patients with hepatocellular carcinoma who have received sorafenib.  *15th Annual Symposium on Clinical Interventional Oncology (CIO) 2013*; Abs 11.


Fiore F, Bilbao JL, Carpanese L et al. The efficacy, safety, and tolerability of radioembolization in unresectable hepatocellular carcinoma with whole-liver, lobar, or segmental treatment. *World Conference on Interventional Oncology (WCIO) meeting* 2012; Poster 18.


Sangro B, Carpanese L, Salvatori R et al. Safety and efficacy of radioembolization amongst patients who met the inclusion criteria for the Sorafenib Hepatocellular Carcinoma Assessment Randomized Protocol (SHARP) trial. *5th International Liver Cancer Association (ILCA) meeting* September 2011; Abs. P-141.

Sangro B, Maini CL, Notarianni E et al. Radioembolization for unresectable hepatocellular carcinoma (HCC) in the elderly. *5th International Liver Cancer Association (ILCA) meeting* September 2011; Abs. P-142.


Cabrera R, George T, Soldevilla-Pico C et al. Safety of sorafenib alone or in combination with locoregional therapy in patients with advanced hepatocellular carcinoma (HCC) and decompensated cirrhosis. ASCO Gastrointestinal Cancers Symposium 2008; Abstract 147.
# Neuroendocrine Tumour Liver Metastases

## Prospective Clinical Studies in Neuroendocrine Tumours Liver Metastases


## Abstracts on Prospective Clinical Studies in Neuroendocrine Tumour Liver Metastases


## Retrospective Studies in Neuroendocrine Tumour Liver Metastases


Saxena A, Chua TC, Zhao J *et al.* Liver-directed therapy for neuroendocrine neoplasm hepatic metastasis prolongs survival following progression after initial surgery. *Journal of Surgical Oncology* 2012; **105**: 342–350.


Cao CQ, Yan TD, Bester L *et al.* Radioembolization with yttrium microspheres for neuroendocrine tumour liver metastases. *British Journal of Surgery* 2010; **97**: 537–543.


**Abstracts on Retrospective Studies in Neuroendocrine Tumour Liver Metastases**


McIntosh EB, Prajapati HJ, Lawal TO et al. Prognostic factors of resin-based Yttrium-90 radioembolization for unresectable metastatic neuroendocrine tumors. *World Conference on Interventional Oncology (WCIO) meeting* 2012; Abs. 49.


Kennedy A, Elkordy M, Campbell EE et al. 90Y radioembolization for neuroendocrine cancers liver metastases provides sustained therapeutic effect with minimal toxicity. *ASCO Gastrointestinal Cancers Symposium* 2012; Abs. 343.


Paprottka PM, Hoffmann RT, Trumm CG et al. 90Yttrium-radioembolization of symptomatic, nonresectable neuroendocrine hepatic metastases. *World Conference on Interventional Oncology (WCIO) meeting* 2011; Abs. 51.


Breast Cancer Liver Metastases

Prospective Clinical Studies in Breast Cancer Liver Metastases

Retrospective Studies in Breast Cancer Liver Metastases

Abstracts on Retrospective Studies in Breast Cancer Liver Metastases

Pancreatic Cancer Liver Metastases

Prospective Clinical Studies in Pancreatic Cancer Liver Metastases

Abstracts on Prospective Studies in Pancreatic Cancer Liver Metastases

Retrospective Studies in Pancreatic Cancer Liver Metastases

Abstracts on Retrospective Studies in Pancreatic Cancer Liver Metastases
Cholangiocarcinoma

Prospective Clinical Studies in Cholangiocarcinoma

Abstracts on Prospective Studies in Cholangiocarcinoma

Retrospective Studies in Cholangiocarcinoma


Abstracts on Retrospective Studies in Cholangiocarcinoma


Melanoma Liver Metastases

Retrospective Studies in Melanoma Liver Metastases


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Lung Cancer Liver Metastases

Retrospective Studies in Lung Cancer Liver Metastases

Cervical Cancer Liver Metastases

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Primary or Metastatic Soft Tissue Sarcomas of the Liver

Abstracts on Retrospective Studies in Primary or Metastatic Soft Tissue Sarcomas of the Liver

Thyroid Cancer Liver Metastases

Retrospective Studies in Thyroid Cancer Liver Metastases
Liver Metastases from Cancer of Unknown Primary

Retrospective Studies in Liver Metastases from Cancer of Unknown Primary


Liver Tumours from Various Cancer Sources

Prospective Clinical Studies in Liver Tumours from Various Cancer Sources


Abstracts on Prospective Clinical Studies in Liver Tumours from Various Cancer Sources

Retrospective Studies in Liver Tumours from Various Cancer Sources


Jakobs TF, Hoffmann RT, Poeperll G et al. Mid-term results in otherwise treatment refractory primary or secondary liver confined tumours treated with selective internal radiation therapy (SIRT) using \( ^{90}\)yttrium resin-microspheres. European Radiology 2007; 17: 1320–1330.

Brock H; Günther RW; Haage P. Leberzirrhose als folge selektiver hepatischer radioembolisation mit \( ^{90}\)Yttrium-mikrosphären. Fortschritte auf dem Gebiet der Röntgenstrahlen und der bildgebenden Verfahren 2006; 178: 538–549. [in German]


**Abstracts on Retrospective Studies in Liver Tumours from Various Cancer Sources**


Dang RP, Fischman AM, Kim E et al. Safety and feasibility of whole-liver Yttrium-90 (Y90) radioembolization. World Conference on Interventional Oncology (WCIO) meeting 2012; Poster 40.

Cholapranee A, Dagli M, Mondschein JI et al. Y-90 Radioembolization as second-line therapy for hepatic metastases. World Conference on Interventional Oncology (WCIO) meeting 2012; Poster 41.

Cholapranee A, Soulen MC. Risk of liver abscess following Y-90 radioembolization in patients with prior biliary intervention. World Conference on Interventional Oncology (WCIO) meeting 2012; Poster 43.

Sharma A, Kolar B, Katz A et al. Y90 radioembolization: Comparison of effects on clinical performance status and liver toxicity in patients with HCC and hepatic metastases from other primary tumors - a single institutional experience. World Conference on Interventional Oncology (WCIO) meeting 2012; Poster 44.

Withrow RC, Pohl C. Treatment of Stage 4 gynecologic malignancies by hepatic radioembolization. World Conference on Interventional Oncology (WCIO) meeting 2012; Poster 45.
Bozkurt M, Volk-Salanci B, Peynircioglu B et al. Accelerated progression of metastatic disease shortly after Y90-microsphere treatment: Is there a causative relation?  


Lam MG, Shah RP, Goris ML et al. Safety of repeated treatment with Yttrium-90 radioembolization.  

Nitz MD, Anderson CL, Saad WE et al. Preliminary analysis of angiographic contrast density as a predictor of liver perfusion change in radioembolization.  

Saxena A, Chua TC, Meteling B et al. Radioembolization with yttrium-90 microspheres is associated with a significantly improved survival compared to conservative therapy after treatment of unresectable hepatic tumors: A large single center experience of 537 patients.  

Ros NF, Silva N, Iñarrairaegui M et al. La radioembolización hepática lobar induce hipertrofia del lóbulo contralateral.  
Spanish Association for the Study of the Liver 2012; Abs.

Nichols EM, Grabowski S, Hanlon A et al. Performance status (PS), number of lesions and interval from metastatic diagnosis to treatment (IMDTT) predict for overall survival (OS) in patients treated with hepatic transarterial radioembolization (TARE) with yttrium-90 (Y90) microspheres.  


Kucuk ON, Soydal C, Lacin S et al. Intra-arterial radioembolization with Y-90 for unresectable primary and metastatic liver tumors and evaluation of treatment response by FDG PET/CT.  

Uslu L, Arslan E, Ozhan M et al. Radioembolization using yttrium-90 microspheres for advanced primary and metastatic liver malignancies.  


Cove-Smith L, Wilson G. Efficacy and toxicity of selective internal radiation therapy (SIRT) with yttrium 90 microspheres for the treatment of unresectable hepatic tumours: a retrospective analysis of 58 patients.  

Sella D, Rilling WS. Cost considerations in interventional oncology: Are IO treatments expensive relative to the alternatives?  

European Congress of Radiology 2011; Abs. C-0718.

Subbiah IM, ChenP, Tanikella R et al. Radioembolization of unresectable primary and secondary hepatic malignancies using yttrium-90: The University of Texas at Houston experience.  


Ruehl R, Seidensticker M, Denecke T et al. Selektive interne radioembolisation (SIRT) mit Mikroshäfern bei extensiven, therapieresistenter, progredienten Lebermalignomen. *Deutsche Gesellschaft für Nuklearmedizin (DGN)* 2008; Abs. [in German]


Janssen J, Quinn R, Morris D et al. Clinical side effects associated with the administration of $^{90}$Y SIR-Spheres. 36th Annual Scientific Meeting of the Australian and New Zealand Society of Nuclear Medicine April 2006; Abs. 53.


Nutting C, Jones B. Techniques for minimizing complications during yttrium-90 radioembolization of unresectable hepatic malignancies. Cardiovascular and Interventional Radiology 2004; 27 (Sup.1): Abs. 9.4.3.
SIR-Spheres microspheres are approved in Australia, the European Union (CE Mark) and several other countries for the treatment of patients with non-operable liver tumours. The papers and abstracts on this page report pre-clinical and clinical experience using SIR-Spheres microspheres in the treatment of malignancy outside of the liver, which are currently investigational in nature and that have not been approved or cleared by regulatory authorities.

**Lung Malignancies**

**Retrospective Studies in Lung Metastases**

**Haematological Malignancies**

**Retrospective Studies in Malignant Lymphomatous Spleenomegaly**

**Primary Renal Cancer**

**Preclinical Studies in Primary Renal Cancer**
Consensus Statements / Guidelines

Colorectal Cancer Guidelines


Hepatocellular Carcinoma Guidelines


Neuroendocrine Tumour Guidelines


**General Consensus Statements / Guidelines**


**Review Articles**

### Colorectal Cancer


de Baere T, Deschamps F. Arterial therapies of colorectal cancer metastases to the liver. *Abdominal Imaging* 2011; 36: 661–670.


Hepatocellular Carcinoma


SIR-Spheres microspheres Bibliography: September 2013


Poon RT. Recent advances in management of hepatocellular carcinoma. *Hong Kong Medical Diary* 2010; 15: 18–22.


**Neuroendocrine Tumours**


Yang TX, Chua TC, Morris DL. Radioembolization and chemoembolization for unresectable neuroendocrine liver metastases – A systematic review. *Surgical Oncology* 2012; **21**: 299–308.


Saxena A, Chua TC, Morris DL. Surgical management and emerging therapies to prolong survival in metastatic neuroendocrine cancer. *Annals of Surgical Oncology* 2011; **18**: S222–S223.


Arnold R, Kegel T. Aktuelle therapiestrategien gegen neuroendokrine tumoren. InFo Onkologie 2010 Feb 18; 3–8. [in German]


Auernhammer CJ. Aktuelle standards und perspektiven in diagnostik und therapie von neuroendokrinen tumoren des gastroenteropankreatischen systems. Journal Onkologie 2008; 04–08. [in German]


Breast Cancer


Cholangiocarcinoma


Ocular Melanoma


Desmoplastic Small Round Cell Tumours

Pancreatic Cancer

General


Hoffmann RT, Paprottka P, Jakobs TF et al. Arterial therapies of non-colorectal cancer metastases to the liver (from chemoembolization to radioembolization). Abdominal Imaging 2011; 36: 671–676..


Carr BI. Regional hepatic therapy for cancer. *Seminars in Oncology* 2010; 37: 82.


Kennedy AS. Intraarterial yttrium-90 microspheres for hepatic malignancies *ASCO Educational Book* 2009; 251–255.

Kennedy A. Targeted therapies address hard-to-treat liver tumors. *Oncology News International* 2009 March 23; 18:


Hoffmann RT, Jakobs TF, Tatsch K, Reiser MF. Selektive interne radiotherapie (SIRT) bei fortgeschrittenen lebertumoren und metastasen. *Deutsche Medizinische Wochenschrift* 2008; 133: 1–4. [in German]
Tatsch K, Hoffmann RT, Pöpperl G. Selektive interne radiotherapie (SIRT) inoperabler lebertumoren mit radioaktiv markierten mikrosphären / Selective internal radiotherapy (SIRT) with radioactive microspheres in unresectable liver tumors. *Nuklearmediziner* 2008; 31: 101–113. [in German]


Mechanistic Aspects of Treatment

Papers on Mechanistic Aspects of Treatment


Zade AA, Rangarajan V, Purandare NC et al. 90Y microsphere therapy: Does 90Y PET/CT imaging obviate the need for 90Y Bremsstrahlung SPECT/CT imaging? *Nuclear Medicine Communications* 2013 Aug 12; ePub doi: 10.1097/MNM.0b013e328364aa4b.


Gulec SA. Considerations in Y-90 microsphere administration via hepatic arterial pump. *Journal of Interventional Oncology* 2008; **1**: 38–42.


Selwyn RG, Avila-Rodriguez MA, Converse AK et al. $^{8}$F-labeled resin microspheres as surrogates for $^{90}$Y resin microspheres used in the treatment of hepatic tumors: a radiolabeling and PET validation study. *Physics in Medicine and Biology* 2007; **52**: 7397–7408.


Abstracts on Mechanistic Aspects of Treatment


Dominguez I, Ifiarrairegui M, Rodriguez M et al. Tumor vascularity and response to radioembolization using Y90 resin microspheres. 4th International Liver Cancer Association (ILCA) meeting September 2010; Abs. P-133.

Chen YW, Lai YC, Lin CY et al. Radiation detection in dialysis room for a uremia patient with Y90 microsphere SIRT – initial experience in KMUH, Taiwan. 3rd European International Radiation Protection Association Congress 2010; Abs. P02-35.


Dezarn W, Kennedy A. Significant differences exist across institutions in 90Y microsphere activities compared to reference standard. American Association for Physicists in Medicine July 2007;


Coldwell D. Selection of patients for treatment of unresectable liver tumours with yttrium-90 microspheres. *Cardiovascular and Interventional Radiology in Europe (CIRSE) 2005 Conference 2005*; Abs. 9.5.3.
**Hepatic Arterial Anatomy**

**Papers on Hepatic Arterial Anatomy**


Thyesoeh JM, Müller S, Schlaak JF *et al.*Selective internal radiotherapy (SIRT) of hepatic tumors: how to deal with the cystic artery. *Cardiovascular and Interventional Radiology* Sep 15; ePub doi: 10.1007/s00270-012-0474-1.

Burgmans MC, Too CW, Kao YH *et al.* Computed tomography hepatic arteriography has a hepatic falciform artery detection rate that is much higher than that of digital subtraction angiography and $^{99m}$Tc-MAA SPECT/CT: Implications for planning $^{90}$Y radioembolization? *European Journal of Radiology* 2012; 81: 3979–3984.


Ahmadzadehfar H, Mühlenbruch M, Sabet A *et al.* Is prophylactic embolization of the hepatic falciform artery needed before radioembolization in patients with $^{99m}$Tc-MAA accumulation in the


Papers on Reduction of Lung Shunting


Abstracts on Hepatic Arterial Anatomy


Imaging

Papers on Imaging


Zade AA, Rangarajan V, Purandare NC et al. 90Y microsphere therapy: Does 90Y PET/CT imaging obviate the need for 90Y Bremsstrahlung SPECT/CT imaging? *Nuclear Medicine Communications* 2013 Aug 12; ePub doi: 10.1097/MNM.0b013e328364aa4b.

Mamawan MD, Ong SC, Senupe JM. Post-90Y radioembolization PET/CT scan with respiratory gating using time-of-flight reconstruction. *Journal of Nuclear Medicine Technology* 2013; 41: 42.


Soydal C, Kucuk ON, Gecim EI et al. The prognostic value of quantitative parameters of $^{18}$F-FDG PET/CT in the evaluation of response to internal radiation therapy with yttrium-90 in patients with liver metastases of colorectal cancer. *Nuclear Medicine Communications* 2013 Mar 7; ePub 10.1097/MNM.0b013e32835f9427.


Weber K, Berger F, Mustafa M et al. [SPECT/CT for staging and treatment monitoring in oncology: Applications in differentiated thyroid cancer and liver tumors.] *Der Radiologe* 2012 Jun 20; ePub doi: 10.1007/s00117-011-2267-y. [in German]


Werner MK, Brechtel K, Beyer T et al. PET/CT for the assessment and quantification of $^{90}$Y biodistribution after selective internal radiotherapy (SIRT) of liver metastases. *European Journal of Nuclear Medicine and Molecular Imaging* 2010; 37: 407–408.


**Abstracts on Imaging**


Bibliography:


Burgmans MC, Irani FG, Soh LJCM et al. The use of intra-arterial CT in addition to angiography and TC99-MAA to guide infusion of yttrium-90 for selective internal radiation therapy. *Cardiovascular and Interventional Radiology in Europe (CIRSE)* 2011; Abs. 2107.5.

Too CW, Irani FG, Tay KH et al. Comparison of diagnostic quality of intra-arterial CT images obtained using cone beam CT and multidetector CT systems for hepatic radioembolisation. *Cardiovascular and Interventional Radiology in Europe (CIRSE)* 2011; Abs. P-352.

Jiang M, F. Nowakowski S, Aaron Fischman A et al. Segmental perfusion differences (SPD) on paired Tc-99m MAA hepatic perfusion imaging (HPI) and Yttrium-90 microsphere (Y-90) imaging:


Domínguez I, Iñarrairaegui M, Rodríguez M et al. Tumor vascularity and response to radioembolization using Y90 resin microspheres. *4th International Liver Cancer Association (ILCA) meeting* September 2010; Abs. P-133.


Dasgupta DJ, Kalogianni E, Corcoran BJ et al. The value of additional SPECT in $^{99m}$Tc-MAA perfusion imaging pre therapy, and $^{90}$Y Bremsstrahlung imaging post therapy, in the management of patients treated with $^{90}$Y microspheres. *European Association of Nuclear Medicine (EANM) Conference* 2009; Abs. OP622.


Managing Side Effects and Complications

Papers on Managing Side Effects and Complications


Thamboo TP, Wai CT, Lim LG, Wang SC. Late gastric ulceration and cytomegalovirus infection following selective internal radiation therapy (SIRT) of the liver. *Pathology* 2008; 40: 303–305.


Brock H; Günther RW; Haage P. Leberzirrhose als Folge selektiver hepatischer radioembolisation mit $^{90}$Yttrium-mikrosphären. *Fortschritte auf dem Gebiet der Röntgenstrahlen und der bildgebenden Verfahren* 2006; 178: 538–549. [in German]


**Abstracts on Managing Side Effects and Complications**


Nutting C, Kennedy A, Kortz E. Radioembolization of liver metastases in the setting of a violated Ampulla. *GEST meeting 2010; Abs.*


Books and Book Chapters

Books


Book Chapters


Stubbs R. Local radio ablative techniques for liver tumors. 2nd ed. Sudbury, Massachusetts: Jones and Bartlett; 2003.

