مرکز آموزشی درمانی شهید مدنی

# Case presentation

Trans-Arterial ChemoEmbolization with Intra-Arterial Chemotherapy

**(TACE-IAC)**


**درتومورهای خلف صفاقی کودکان**

**دکتربابک عبدالکریمی هماتولوژیست آنکولوژیست کودکان**

**دکتر آرش امین اینترونشن کاردیولوژیست وفلوی کارديياک ایمیجینگ**

# *Case 1:*

- بیماردختربچه2 ساله باتوده نوروبلاستوم خلف صفاقی بزرگ وغیرقابل جراحی به دلیل aort encasement که به 14 جلسه شیمی درمانی salvage, conventional جواب نداده بود وبارضایت خانواده ازفیلددرمانgive up شد.بعدازیک وقفه حدود2 سال تحت 2 جلسهTACE-IAC وجراحی compelet resection قرارگرفت.پاتولوژی نهایی دراثرtransformation تومورگانگلیونوروما گزارش شد.

# *Case 2:*

- دختر 4 ساله باتوده نوروبلاستوم خلف صفاقی بزرگ و غیرقابل جراحی به دلیل aort encasement که به 16 جلسه شیمی درمانی conventional ,salvage ویک نوبت جراحی partial resectionجواب نداده بود تحت 2 جلسهTACE-IAC وجراحی compelet resectionقرارگرفت.پاتولوژی نهایی تومورنوروبلاستوما گزارش شد که برای MIBG therapy وhsct اتولوگ اعزام شد .

# Case 3:

- پسربچه 3 ساله باتوده نوروبلاستوم خلف صفاقی بزرگ درمجاورت نخاع توراسیک وباگسترش به شکم ولگن وغیرقابل جراحی به دلیل
- aort encasement که به 16 جلسه شیمی درمانی conventional ,salvage جواب نداده بود وتحت 2 جلسهTACE-IAC وجراحی compelet resection قرارگرفت. به دلیل مثبت بودنMIBG بیمار ووجودمتاستاز استخوانی تحت درمان مجددبارژیم شیمی درمانیSALVAGE قرارگرفت ومتاسفانه دراین بین مجددتومور مجاورنخاع توراسیک رشد کرد وکودک دچاردرد شدیداندامها وپاراپلژی شد.مجددیک نوبت دیگرTACE-IAC برای تومورتوراسیک انجام شدو برای مشاوره رادیوتراپی اعزام شدکه جواب مثبت جهت رادیوتراپی داده نشد.درحال حاضر بیمارروی شیمی درمانی مترونومیک میباشد تاجلسه چهارمTAEC-IAC انجام شود.

# *Intra-arterial chemotherpy with chemoembolization*

- Indication: unresectable tumor change to resectable tumor
- **IAC:** chemotherapy agents transport to tumor via feeding artery of tumor
- **TACE:** occlusion of feeding artery via liposomal products(hepaspher)
-

# TACE-IAC

## درتومورهای بالغین درایران

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DOI: 10.1111/ajco.12759

CASE REPORT

WILEY

# Complete response in a patient with stage IV adrenocortical carcinoma treated with adjuvant trans-catheter arterial chemo-embolization (TACE)

Eugene Wong[1,2] | Sarah Jacques[1,2] | Michael Bennett[1,2] | Vineet Gorolay[1] | Adrian Lee[1,2] | Stephen Clarke[1,2]

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**Abstract**

Adrenocortical carcinoma is a rare cancer, with estimate population incidence of 0.7–2.0 cases per 1 million each year. It also carries poor prognosis with estimated 5-year survival of less than 15% of those with metastatic disease and has a poor response to cytotoxic treatment. A randomized controlled trial published in 2012 by Fassnacht *et al.* demonstrated improved progression-free survival with first-line etoposide-doxirubicin-cisplatin-mitotane (EDP-M) compared to first-line streptozocin–mitotane in patients with stage III–IV disease.

We report a case of a 25-year-old female diagnosed with adrenocortical carcinoma with liver and lung metastases treated with adjuvant EDP-M chemotherapy. During her treatment, the patient experienced ongoing significant liver-associated burden of disease, which prompted a trial of trans-hepatic arterial chemoembolization with doxorubicin and mitomycin. The patient subsequently experienced complete remission of disease at 18 months with no fludeoxyglucose (FDG) avid lesions on PET/CT.

KEYWORDS
adrenocortical, carcinoma, TACE

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The Scientific World Journal
Volume 2014, Article ID 160138, 8 pages
http://dx.doi.org/10.1155/2014/160138

Hindawi

*Clinical Study*

# Intra-Arterial Chemotherapy with Doxorubicin and Cisplatin Is Effective for Advanced Hepatocellular Cell Carcinoma

**Ming-Chun Ma,[1] Yen-Yang Chen,[1,2] Shau-Hsuan Li,[1,2] Yu-Fan Cheng,[2,3] Chih-Chi Wang,[2,4] Tai-Jan Chiu,[1,2] Sung-Nan Pei,[1,2] Chien-Ting Liu,[1] Tai-Lin Huang,[1,2] Chen-Hua Huang,[1,2] Yu-Li Su,[1] Yen-Hao Chen,[1] Sheng-Nan Lu,[2,5] and Kun-Ming Rau[1,2]**

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[4] *Department of Surgery, Kaohsiung Chang Gung Memorial Hospital, 123 Ta-Pei Road, Niaosong District, Kaohsiung 833, Taiwan*
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Advanced hepatocellular carcinoma (HCC) remains a fatal disease even in the era of targeted therapies. Intra-arterial chemotherapy (IACT) can provide therapeutic benefits for patients with locally advanced HCC who are not eligible for local therapies or are refractory to targeted therapies. The aim of this retrospective study was to analyze the effect of IACT with cisplatin and doxorubicin on advanced HCC. *Methods.* Patients with advanced HCC who were not eligible for local therapies or were refractory to sorafenib received doxorubicin (50 mg/m$^2$) and cisplatin (50 mg/m$^2$) infusions into the liver via the transhepatic artery. Between January 2005 and December 2011, a total of 50 patients with advanced HCC received this treatment regimen. The overall response rate (ORR) was 22% in all treated patients. In patients who received at least 2 cycles of IACT, the ORR was 36.7%, and the disease control rate was 70%. Survival rate differed significantly between patients who received only one cycle of IACT (group I) and those who received several cycles (group II). The median progression-free survival was 1.3 months and 5.8 months in groups I and II, respectively ($P < 0.0001$). The median overall survival was 8.3 months for all patients and was 3.1 months and 12.0 months in groups I and II, respectively ($P < 0.0001$). The most common toxicity was alopecia. Four patients developed grade 3 or 4 leukopenia. Worsening of liver function, nausea, and vomiting were uncommon side effects. This study demonstrated clinical efficacy and tolerable side effects of repeated IACT with doxorubicin and cisplatin in advanced HCC. Our regimen can be an alternative choice for patients with adequate liver function who do not want to receive continuous infusion of IACT.

# TACE-IAC
# در تومور های کودکان در دنیا

## Transarterial chemoembolization in children to treat unresectable hepatocellular carcinoma

Krista E. Weiss, Daniel Y. Sze, Arun A. Rangaswami, Carlos O. Esquivel, Waldo Concepcion, Edward A. Lebowitz, Nishita Kothary, Matthew P. Lungren

First published: 29 April 2018 | https://doi.org/10.1111/petr.13187 | Citations: 10

Children with unresectable HCC have a dismal prognosis and few approved treatment options. TACE is an effective treatment option for adults with HCC, but experience in children is very limited. Retrospective analysis was performed of 8 patients aged 4-17 years (4 male, mean 12.5 years) who underwent TACE for unresectable HCC. Response to TACE was evaluated by change in AFP, RECIST and tumor volume, PRETEXT, and transplantation eligibility by UCSF and Milan criteria. Post-procedure mean follow-up was 8.2 years. Mean overall change in tumor volume for the 8 patients was 51%. Percent change in AFP ranged from a decrease of 100% to an increase of 89.3%, with a mean change of −49.6%. Two patients did not undergo resection or transplantation and died of progressive disease. Six patients underwent orthotopic liver transplantation with mean first TACE-to-transplant interval of 141 days (range 11-514). Following transplantation, 5 patients were alive at the end of the follow-up period and one died of recurrent disease. Based on our initial experience, TACE for children with unresectable HCC appears to be a safe and effective method for managing hepatic tumor burden and for downstaging and bridging to liver transplantation.

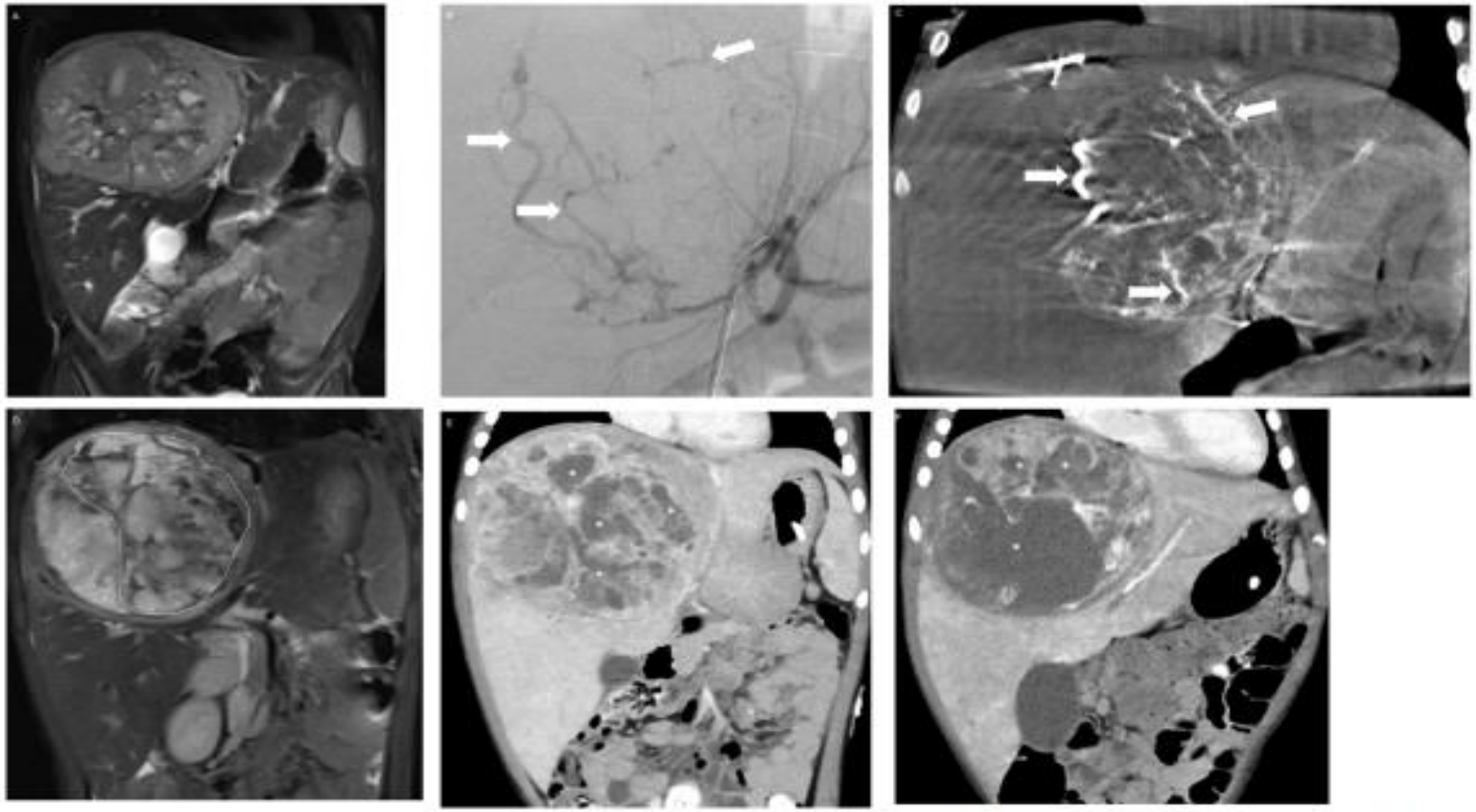

**Fig. 1** T2- weighted fat saturated coronal (**a**) MR image demonstrating a large hepatocellular carcinoma in a 2-year-old male patient which was unresponsive to systemic chemotherapy. **b** Angiography obtained during transcatheter arterial chemoembolization demonstrating several hepatic arterial branches encasing and supplying the tumor (arrows). These feeders were injected with 30 mg of doxorubicin emulsified with lipiodol followed by embolization with 150–250-μm poly vinyl alcohol particles confirmed on cone-beam computed tomography (**c**) obtained post embolization demonstrating the radio-opaque embolization beads in the tumor bed (arrows). **d** Post embolization T1- weighted post contrast coronal MRI obtained 3 weeks later demonstrating heterogeneous necrotic area (dotted line) within the tumor. Coronal computed tomography obtained 3 weeks (**e**) after the first TACE procedure and 3 weeks (**f**) after the second TACE procedure demonstrating increasing necrotic areas within the tumor (asterisk). The patient underwent a successful liver transplant 6 weeks later

# TACE-IAC
# درتومورهای کودکان درایران

1- یک مورد تومورویلمز دربیمارستان رسول اکرم تهران

2- دو مورد بیمارستان مفید (رابدومیوسارکوم ویک مورد هپاتوبلاستوم)

Hindawi
Journal of Ophthalmology
Volume 2020, Article ID 3638410, 16 pages
https://doi.org/10.1155/2020/3638410

*Review Article*

# The Role of Intraarterial Chemotherapy in the Management of Retinoblastoma

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*Introduction.* Retinoblastoma is the most common primary intraocular neoplasm in children. With the advances in medicine, the armamentarium of available treatment modalities has grown. Intraarterial chemotherapy is a relatively new treatment method with promising outcomes. The purpose of this literature review is to evaluate its role in the management of retinoblastoma. *Methods.* A systematic online search was conducted using Ovid Embase and Ovid Medline. The final results included 23 studies. The studies were published between 2011 and 2019. The studies evaluated the technical success rate of IAC, globe salvage rate, and ocular and systemic complications, as well as the occurrence of deaths, metastasis, and secondary neoplasms. In total, 1827 eyes with retinoblastoma were analysed. The follow-up was between 0 and 252 months. *Results.* Overall globe retention rate ranged from 30% to 100%. Sixteen out of 23 studies reported ocular salvage between 60 and 80%. Eyelid oedema and erythema were the most commonly reported ocular complications following IAC. The most common systemic complications included nausea, vomiting, and neutropenia. Metastases and deaths were reported in 6 out of 23 studies. Three studies reported the development of secondary neoplasms. The technical success rate of IAC procedure ranged from 91% to 100%. *Discussion.* The studies have shown that IAC is a safe and effective treatment for advanced retinoblastoma, especially group D. It allows to save the globe without compromising patients' survival. Local and systemic complications are acceptable. The role of IAC in less advanced tumours is yet to be established. Future work should focus on conducting larger prospective studies with longer follow-up. Multiple novel therapies for the management of retinoblastoma are currently being tested, including angiogenic inhibitors and targeted agents. The results seem to be promising. Future advances require a further in-depth understanding of unique genetics of retinoblastoma and complex interactions between tumour cells and their microenvironment.

FEATURE ARTICLE

# Intra-Arterial Chemotherapy for Limb Preservation in Patients With Osteosarcoma: Nursing Implications

Ellyn Matthews, PhD, RN, AOCN®, CRNI, Katie Snell, RN, BSN, OCN®, and Heather Coats, RN, MS, APN, OCN®

Osteosarcoma is an aggressive tumor found in children and young adults, originating primarily in the legs or arms. The high-grade tumor grows in a circular, ball-like mass in the bone tissue. Before the 1970s and the advent of chemotherapy use in osteosarcoma, treatment consisted solely of amputation. More recently, a preoperative regimen of intra-arterial (IA) cisplatin and infusional doxorubicin with limb-sparing procedures has provided an effective treatment option and improved survival for many patients with osteosarcoma. IA chemotherapy is administered through a small, temporary, external catheter that rests in the arterial vessel that supplies the tumor. The primary advantage of IA chemotherapy administration is the delivery of a higher chemotherapy concentration directly to the tumor site. Nursing management of patients with IA chemotherapy requires knowledge of treatment side effects and procedure-related assessments. Further implications for practice include instructing patients and families before and after the insertion of the IA line and giving discharge and long-term follow-up education. Oncology nurses are well positioned to assist children and young adult patients through difficulties with adjustment after treatment is completed and a response has been achieved, owing to advanced communication skills and knowledge of developmental stages and survivorship issues.

# استخراج پروتوکل ومراحل انجام پروسیجر:

پروتکل شیمی درمانی انترونشیونال رژیونال

## Interventional chemotherapy_+TACE:

(Transarterial Chemoembolization)

**Patient name:**

**Procedure type: intra-arterial chemotherapy_+chemoembolization**

**Tumor type:**

**Procedure description:**

**Experts team(physicians):**

**Side effects:**

**Precautions:**

**Follow up:**

# Drug preparation

Loading HepaSphere Micro...
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# HepaSphere™ Microspheres (Outside US Only)

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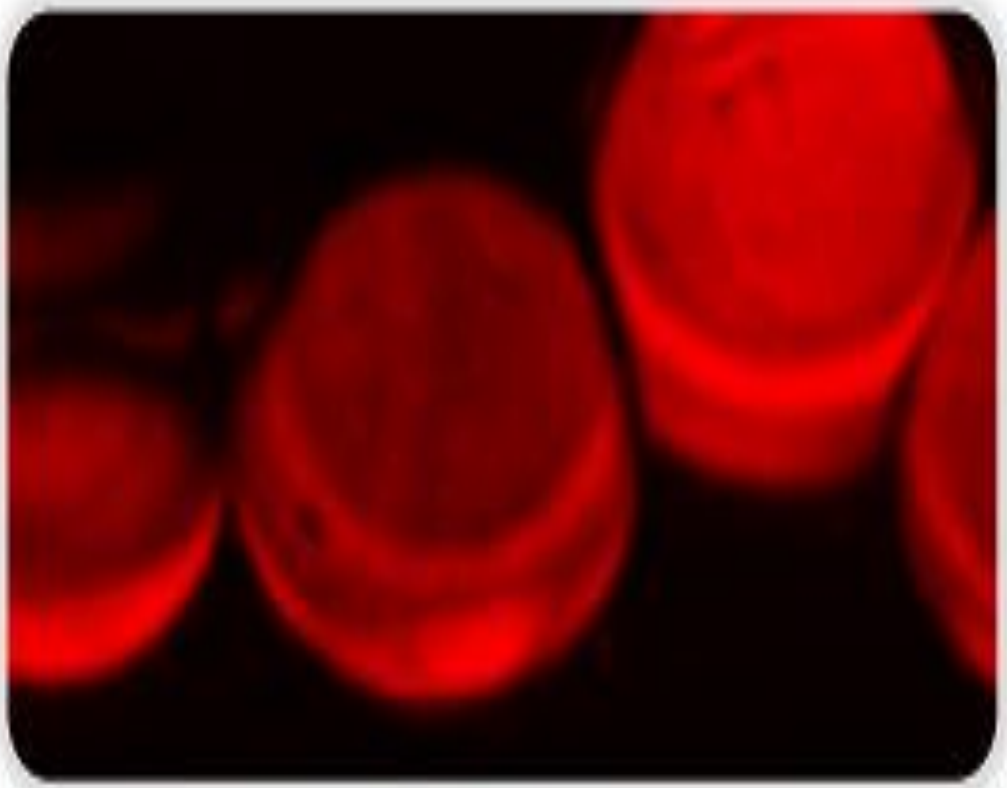
## FAST LOADING

HepaSphere, also known as superabsorbent polymer (SAP) microsphere, is the only microsphere that:

- Is packaged dry and ready for reconstitution
- Works like a sponge and loads the drug throughout the microsphere
- Loads ≥90% of doxorubicin (liquid or powder prepared with normal saline) in <15 minutes*
- Has a 15-day storage and stability lifetime**
- Once reconstituted, swells to approximately 4x the size printed on the product label
- Can absorb fluids up to 64x its dry-state volume

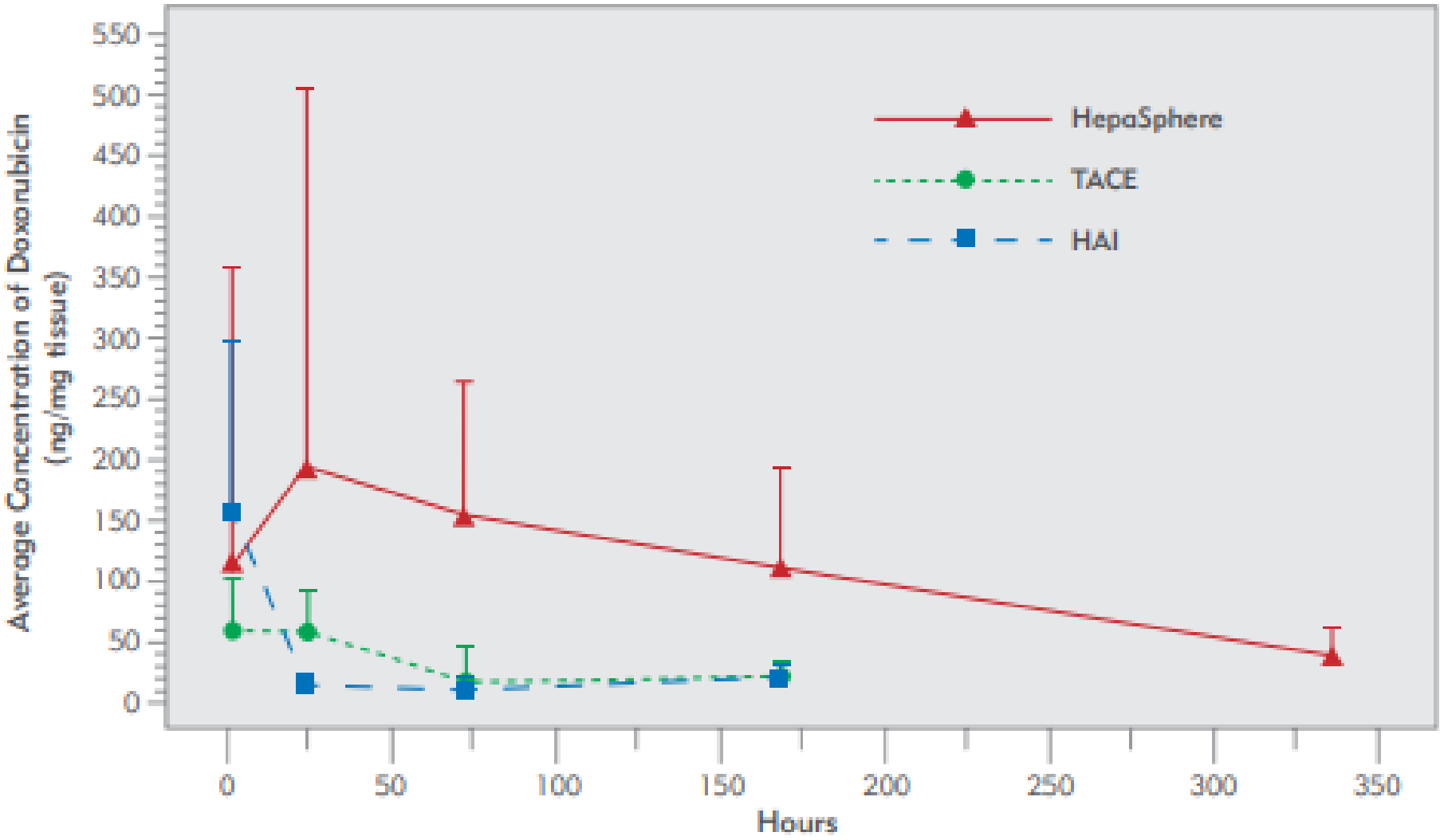
# THOROUGH LOADING & SUSTAINED ELUTION

Doxorubicin is loaded throughout HepaSphere Microspheres and is retained by an ionic bond, providing a sustained release over 14 days[2]; with peak intratumoral concentration of doxorubicin observed at 3 days.[3]



*Photomicrograph of cross sections of HepaSphere Microspheres loaded with doxorubicin (original magnification, 20x). The red color indicates the presence of doxorubicin, which is loaded throughout the microsphere. Data on file.*

# DELIVER MORE DRUG DIRECTLY TO THE TUMOR FOR LONGER[2]

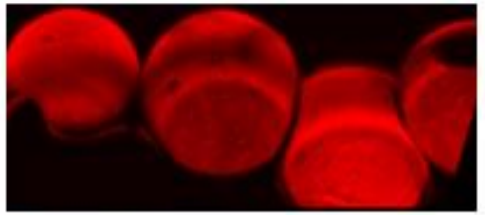



*In the hepatic arterial infusion (HAI) and transarterial chemoembolization (TACE) groups, intratumoral doxorubicin levels declined to negligible levels at 1 and 3 days after treatment, while in the HepaSphere group, the intratumoral doxorubicin level was still detectable at 14 days after treatment and was higher than that in the other groups at 1, 3, and 7 days.*

# Compelling Advantages for Drug-Eluting TACE

## ADVANTAGE:

**Drug loading throughout the entire spherical volume**

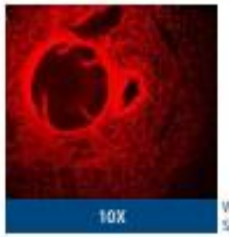


**Consistent loading throughout the sphere offers potential for optimal drug loading and delivery.**

Cross section of HepaSphere Microspheres loaded with doxorubicin originally taken at 20x magnification. The red color indicates the presence of doxorubicin. Data on file at BioSphere Medical.

## ADVANTAGE:

**Penetration of doxorubicin into surrounding tissue**

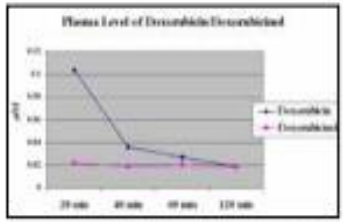



With kind permission from Springer Science and Business Media

**In a VX-2 animal model, HepaSphere 50-100µm Microspheres eluted doxorubicin to a distance of up to1600 microns into the surrounding tumor tissue assessed 24 hours after delivery[1].**

## ADVANTAGE:

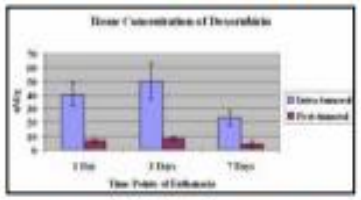
**Low systemic drug exposure of doxorubicin**




Plasma concentration of doxorubicin and doxorubicinol of HepaSphere loaded microspheres in a VX-2 model[2]

## ADVANTAGE:

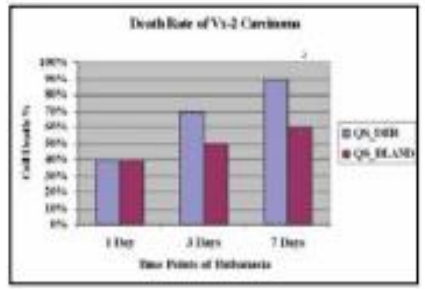
**Sustains greater tumoral concentration of doxorubicin within tumor vs. outside of tumor**




Intra-tumoral/peri-tumoral concentration of doxorubicin loaded HepaSphere Microspheres in a VX-2 model[2]

## ADVANTAGE:

**Effective tumor cell "kill" rate vs. bland embolization**



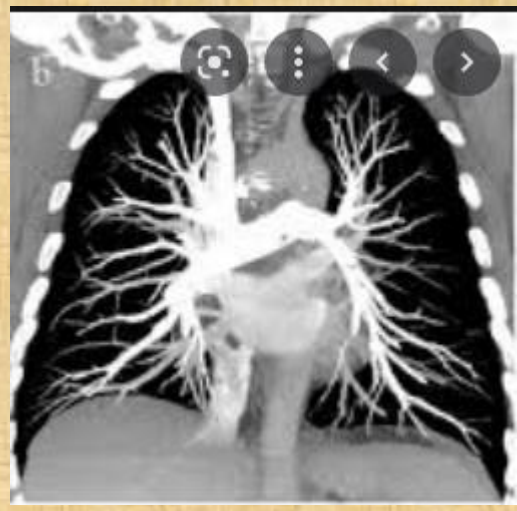

## ADVANTAGE:

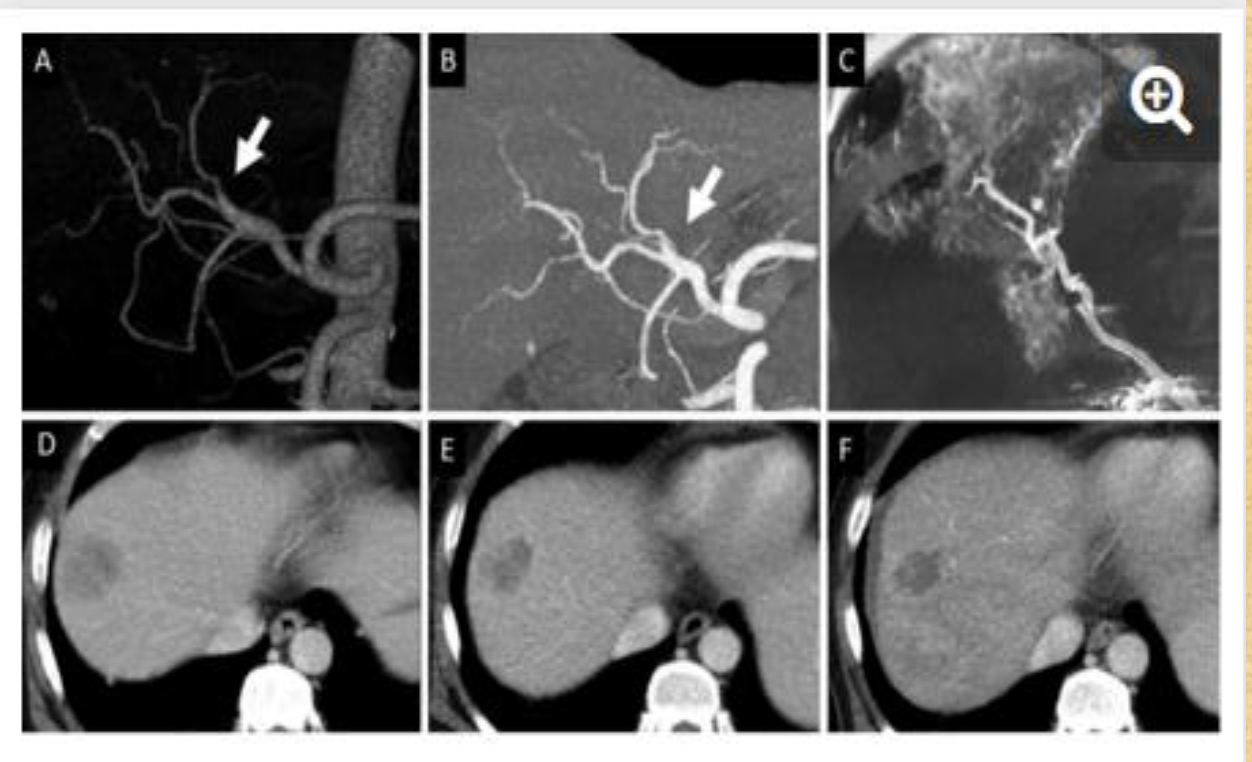
**Encouraging initial clinical experience with HepaSphere Microspheres in HCC Patients[3]**

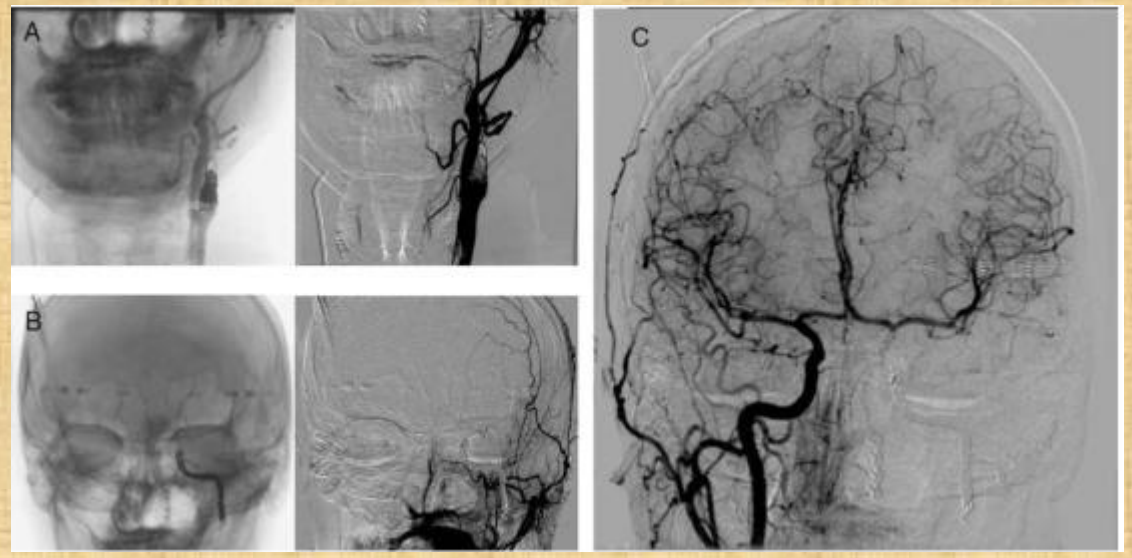

| | |
|---|---|
| N | 50, Child-Pugh A/B |
| Loading | 50 mg |
| # treatments | Up to 3 |
| Follow-up interval | 6 months |
| Objective Response | 77.4% |

**Note: Not controlled, not randomized, 4 sites, doxorubicin or epirubicin**

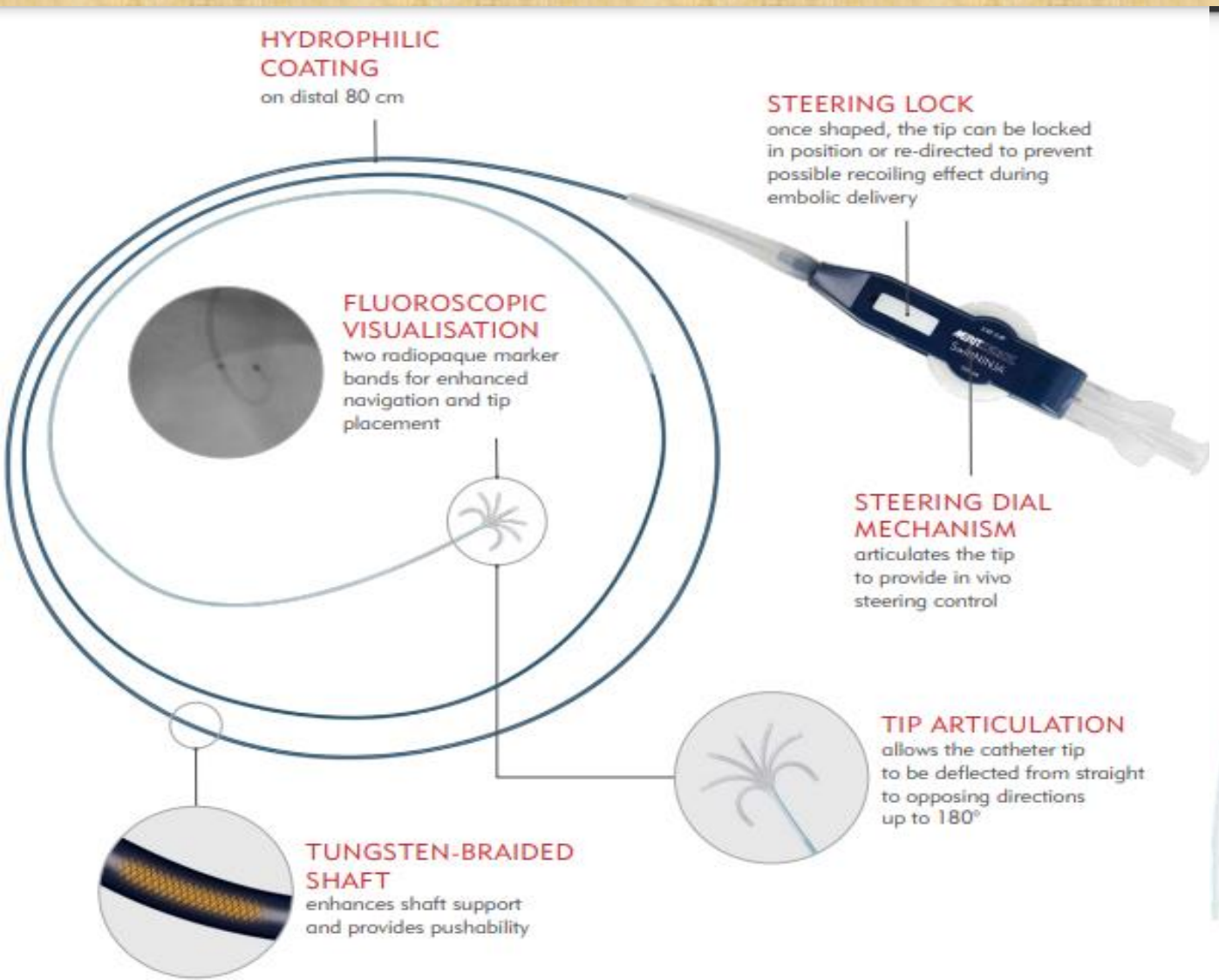
# Arterial mapping study & pretreatment planing:

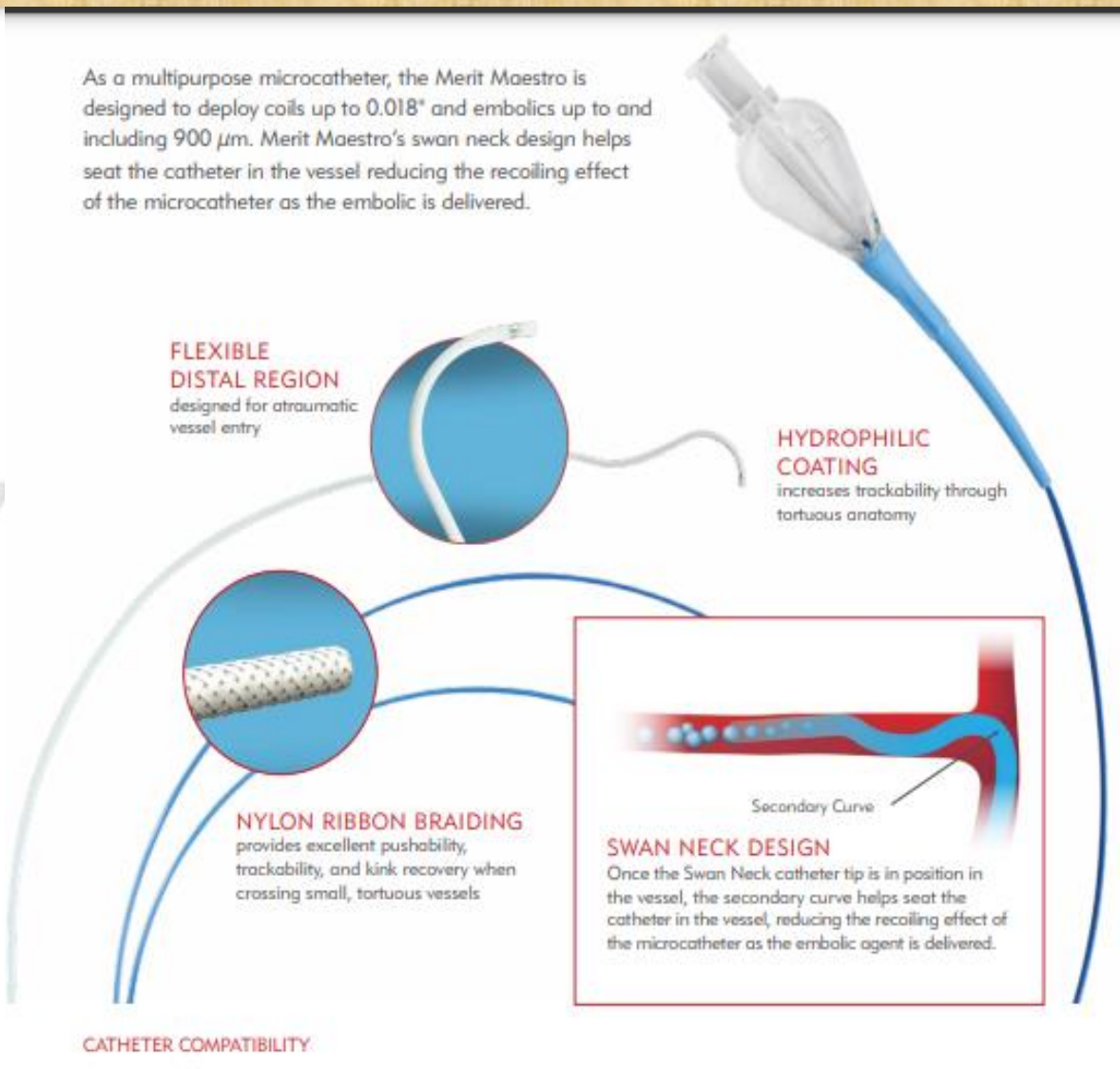




# Superselective angiography:

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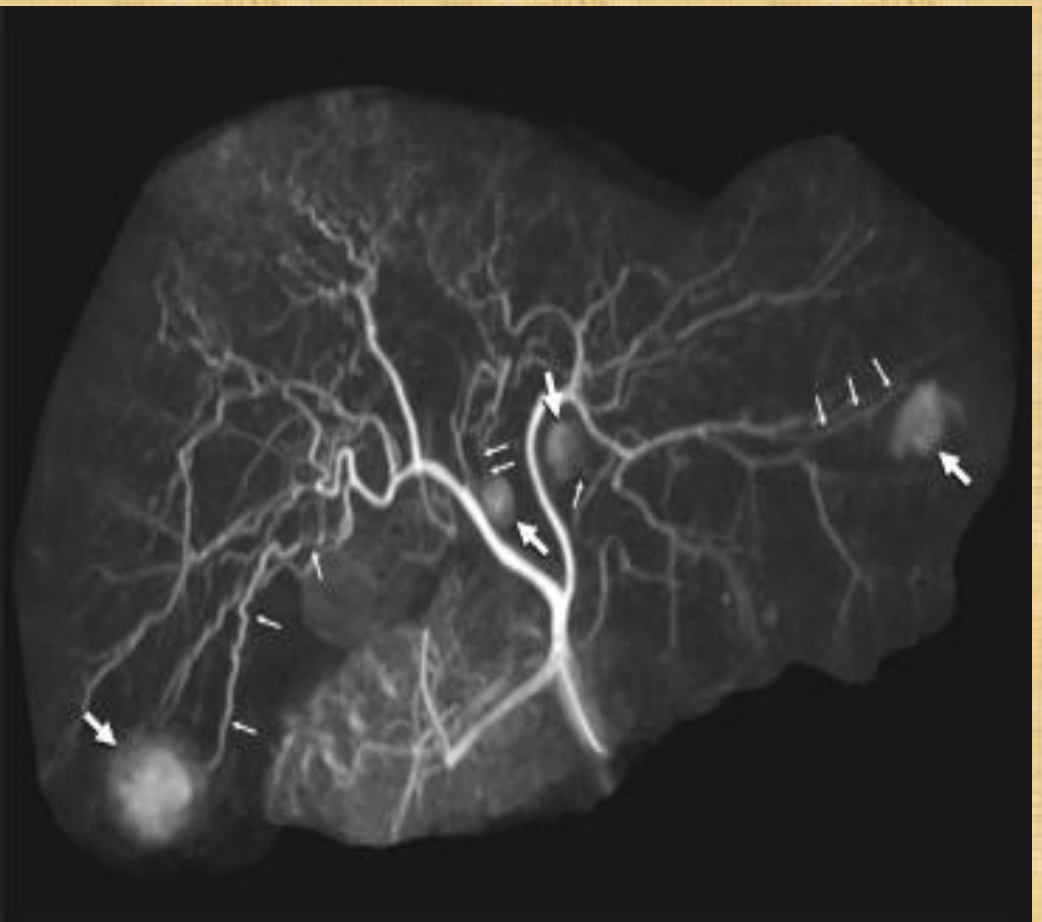
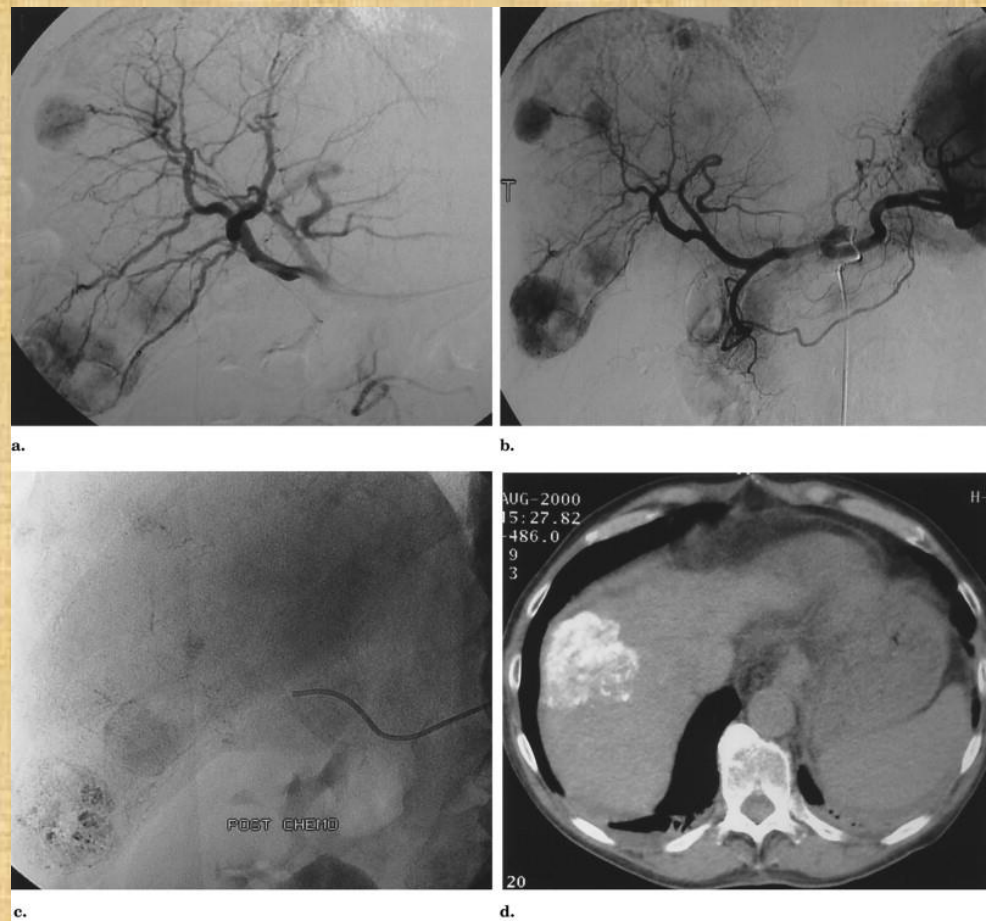
# Imaging after chemoembolization:





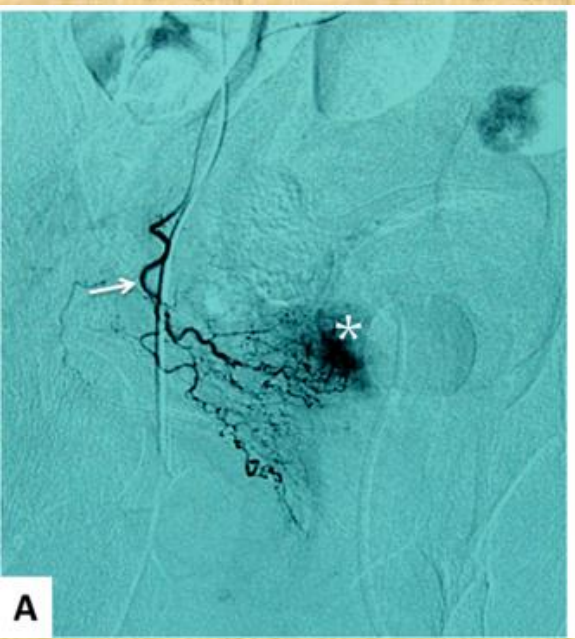
# ملزومات انجام کار:

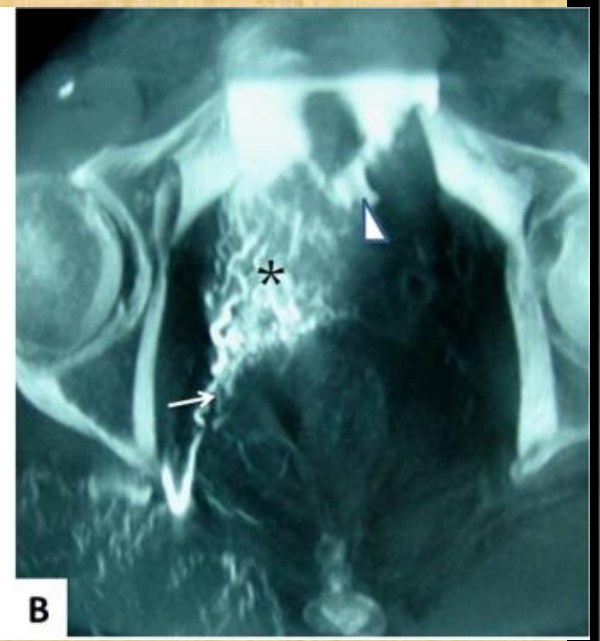
1.pre-treatment WBC> 3000/ul, Plt> 120,000/nl and Hb >9.5 gm/dl. Patients' T.Bil and Cr be normal.

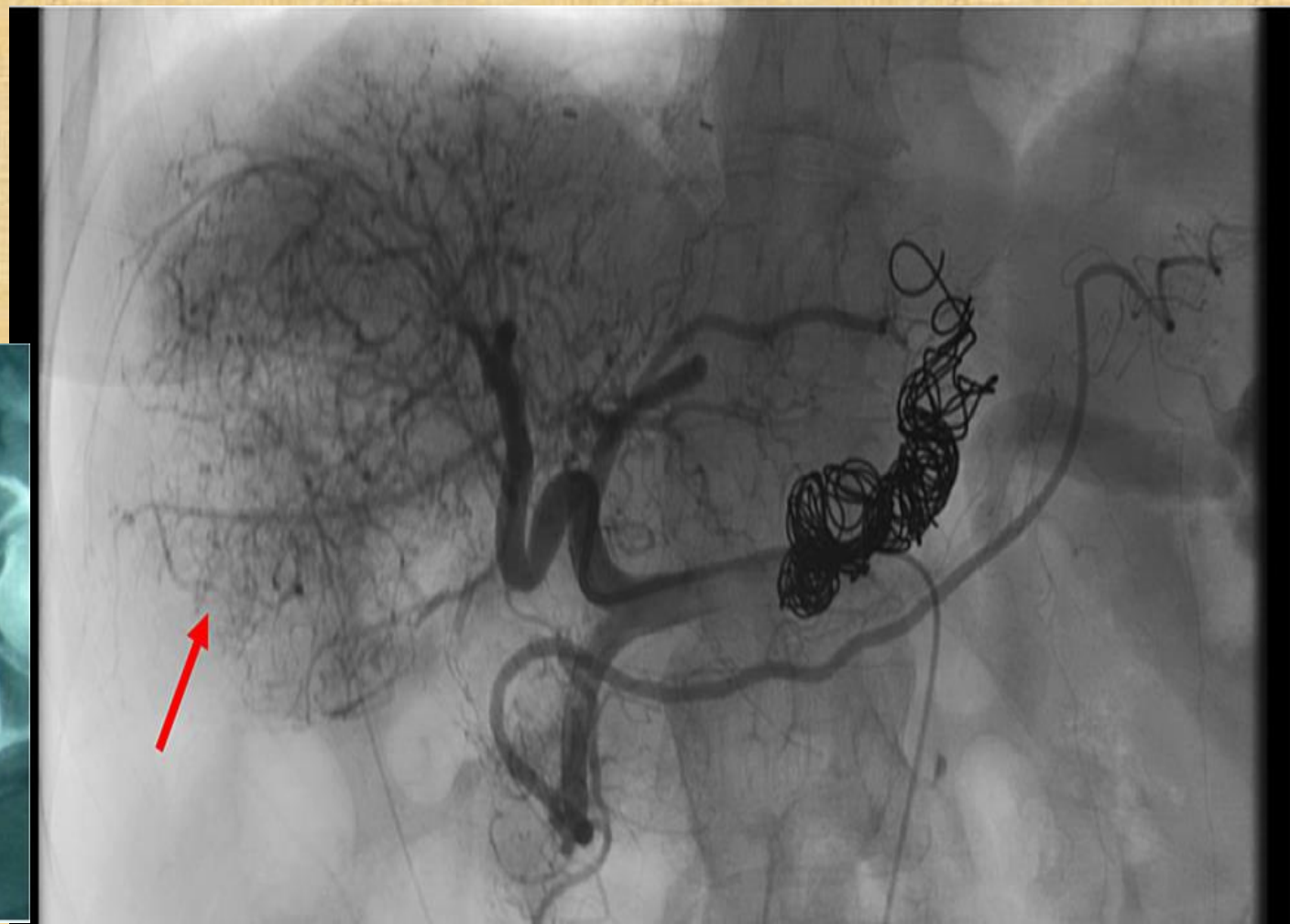
- 2. 3-6 weekly intervals up to 12 cycles,
- 3. **Adriamycin** and **Cisplatin/Carboplatin**
- 4. antiemetic (granisetron 3-8 mg) & proton pump inhibitor(PPI)
- 5.(filgrastim) at a dose of 5 ug/kg/d from day 10 afterchemotherapy, for 6 consecutive days
- 6. Modification of pain & sedation(ketamin-antispasmodic)
- 7. IV hydration the night before the procedure
- 8. Foley catheter the morning of IA line placement
- 9. beforecisplatin administration, premedications, including lorazepam, furosemide, dexamethasone
- 10. bed rest for an additional 4 hours.When bed rest is no longer necessary, theFoley catheter can be removed; IV fluid continues for another 24 hours; intake and output are
- monitored strictly.

# Future procedures:

- brain tumors
- Limb bone tumos
- Pelvic bone tumor



# تشکر از توجه شما