



CEUS nelle neoplasie gastro-intestinali

V. Arienti

Centro di Ricerca e Formazione in
Ecografia Internistica, Interventistica e Vascolare
Medicina Interna A - Ospedale Maggiore, Bologna - Italy

Presupposti dell'uso della CEUS nelle malattie oncologiche

- E' dimostrata la relazione tra neoangiogenesi e crescita tumorale
- Necessità di nuovi vasi da parte del tumore quando il suo vol. > 1-3 mm³
- La neoangiogenesi correla con l'invasione tumorale ed il processo di metastatizzazione

Presupposti dell'uso della CEUS nelle malattie oncologiche

- E' dimostrata la relazione tra neoangio **NEOANGIOGENESI** rale
- Necessità di nuovi vasi da parte del tumore quando il suo vol. > 1-3 mm³
- La neoangio **PROGnosi PEGGIORE** l'invasione tumorale ed il processo di metastatizzazione

CEUS e neoangiogenesi (studio di validazione)

Gene Therapy (2007) 14, 106–117
© 2007 Nature Publishing Group. All rights reserved. ISSN 1526-8857 106/07

ORIGINAL ARTICLE
Dynamic assessment of antiangiogenic therapy by monitoring both tumoral vascularization and tissue degeneration

C Magnon^{1,5}, A Galaup^{3,5}, V Rouffiac⁴, P Opolon¹, E Connault¹, M Rose², M Ferricaudet¹, A Roche^{4,6}, S Germain^{3,5}, F Griseccioli^{1,6} and N Lassau^{1,5*}

¹UMR 8121 Neurologie et transfert de gènes, Institut Gustave Roussy, Villejuif cedex, France; ²INSERM U106 Pathologie vasculaire et embriologie rénale, Paris, France; ³Chaire de Médecine Expérimentale, Collège de France, Paris, France; ⁴Laboratoire d'Imagerie du petit animal (LIPA), Institut Gustave Roussy, Villejuif cedex, France; ⁵Département de statistiques, Institut Gustave Roussy, Villejuif cedex, France; ⁶Département d'imagerie médicale, Institut Gustave Roussy, Villejuif cedex, France and ⁷Service d'Hématologie Biologique A, AP-HP Hôpital Européen Georges Pompidou, Paris, France

- Studio su k mammario in modello murino (231 topi) valutato con CEUS con (HFCDUS) e senza (HFUS) Color Doppler e valutazione MVD all'IHC
- Tre gruppi: controllo, trattati con Canstatina e K1-5

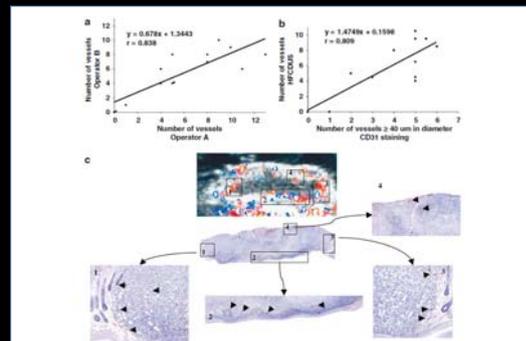


Figure 2 Evaluation of the reproducibility and accuracy of contrast-enhanced ultrasonography in quantifying intra-tumoral microvessels compared to IHC. (a) Graph shows inter-operator reproducibility of HFCDUS technique in quantifying the number of intra-tumoral vessels of untreated MDA-MB-231 tumors. (b) Microvessels in untreated tumors were quantified with CD31 staining or the HFCDUS technique. A linear correlation was shown between the number of HFCDUS-quantified microvessels and the number of CD31-stained microvessels with $40 \mu\text{m}$ in diameter. (c) A representative HFCDUS image depicts intra-tumor vascularization and the concordance with the digitized CD31-stained histological section of the same untreated tumor. 1–4 Magnification of four vascularized tumor zones ($\times 100$). Note peripheral microvessels penetrating the tumor (black arrows).

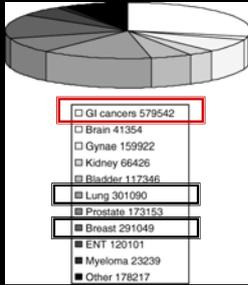
Magnon C et al. Dynamic assessment of antiangiogenic therapy by monitoring both tumoral vascularization and tissue Degeneration, Gene Therapy 2007;14: 106–117.

Valutazione neoangiogenesi tumorale (pro e contro delle varie tecniche di immagine)

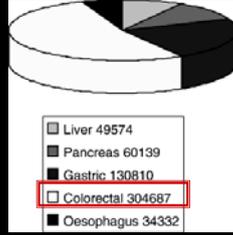
Functional imaging technique	Resolution	Advantages	Limits
CEUS	50–500 μm	Non-irradiant Excellent resolution Real-time	Attenuation limited resolution
CE-MRI	100 μm	Non-irradiant Good resolution CA <1 kd \rightarrow perfusion and permeability	Costly
CECT	50 μm	Good resolution CA <1 kd \rightarrow perfusion and permeability	Irradiant Costly Limited sensitive
PET	1–2 mm	Excellent sensitivity	Irradiant Costly Poor resolution False positive

Lamuraglia M. et al. Clinical relevance of contrast-enhanced ultrasound in monitoring anti-angiogenic therapy of cancer: Current status and perspectives. Critical Reviews in Oncology/Hematology 2010;73:202–212.

Gastrointestinal cancers are the most common cancers in Europe



Incidenza neoplasie



Incidenza neoplasie TGE

Keighley MR: Aliment Pharmacol Ther 2003

CEUS, angiogenesi e tumori gastrointestinali

- CEUS nei tumori gastrointestinali: studi prevalentemente effettuati su K epatici e pancreatici
- Due soli studi su CEUS e TGE (Ca Gastrico e GIST)

Carcinoma Gastrico

Ruolo dell'US transcutanea
Esame indicato in dispeptici con "sintomi di allarme" (linee Guida SIUMB)

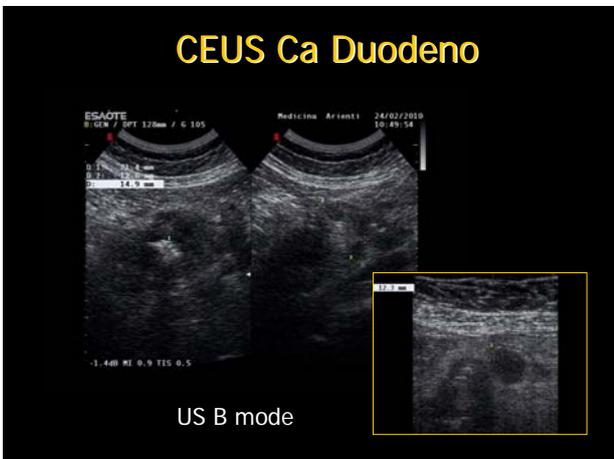


Forma nodulare
parziale ed irregolare ispessimento parietale

CEUS
Li Shiyun et al, Ultrasound in Med. & Biol., Vol. 35, No. 7, pp. 1086-1091, 2009







EGDS

> Substenosi duodenale, lesione ulcerativa di DII sospetta per lesione infiltrativa....

> Istologia
Adenocarcinoma scarsamente differenziato infiltrante, ulcerato ...



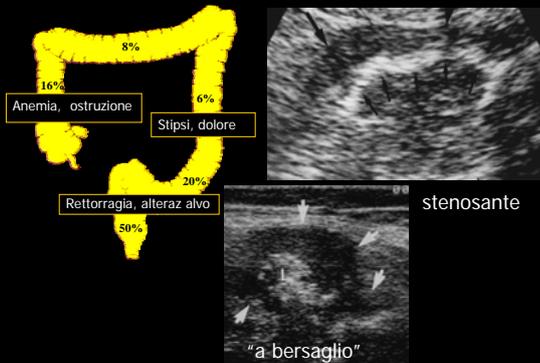
Cortesia Dott. N. D'Imperio
Gastroenterologia Osp. Maggiore (Bo)

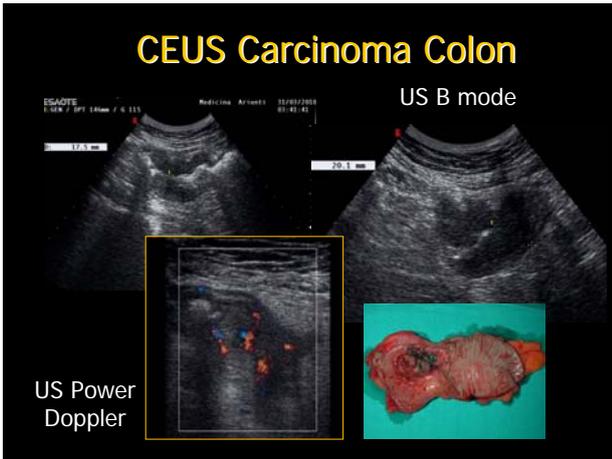
CEUS Ca Duodeno

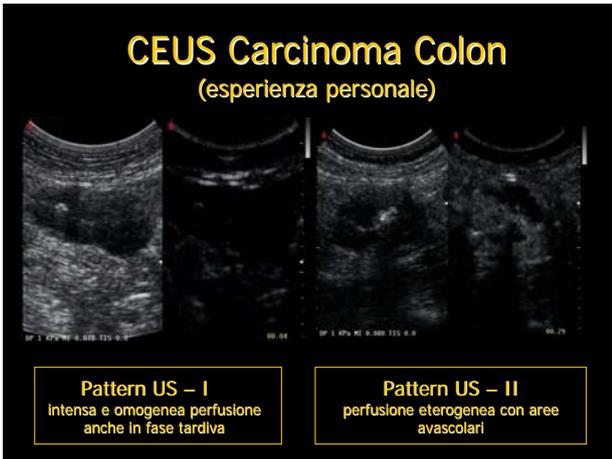


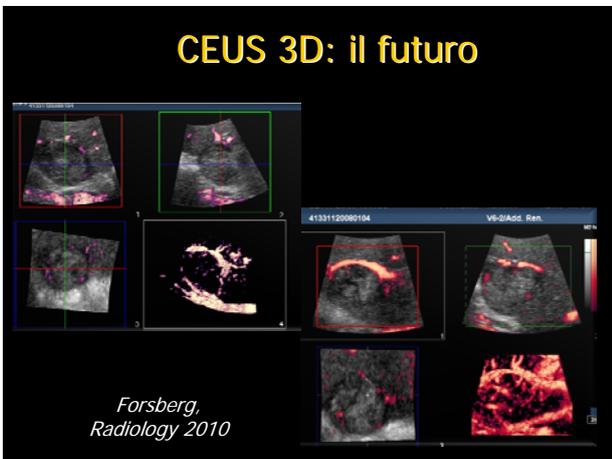
Fase arteriosa

Carcinoma del Colon









CEUS e neoplasie gastrointestinali (il futuro)

