



MODIFICAZIONI CLINICHE E TESSUTALI DEGLI STADI AVANZATI DELL' IVC

Dichiarazione: il sottoscritto dichiara che la presente relazione è esente sia da conflitto interessi che di trasparenza.

(Gaz. Uff. 26-1-2012 e succ., Policy 0044 EMA/513078/2010 e succ.)

Marcello Izzo



PREMESSA
ACASSANDRA
CHRISTA WOLF

edizioni di
SOCIETÀ MEDICO-SCIENTIFICA
GIORGIO MOLINARI
MONDADORI

MALATTIA VENOSA CRONICA (M.V.C.):

CEAP classification

Clinical description

C0	No visible or palpable signs of venous disease
C1	Telangiectasias or reticular veins
C2	Varicose veins; distinguished from reticular veins by a diameter of 3 mm or more
C3	Edema
C4	Changes in skin and subcutaneous tissue secondary to CVD, divided into 2 sub-classes to better define the differing severity of venous disease: C4a: pigmentation or eczema C4b: lipodermatosclerosis or atrophie blanche
C5	Healed venous ulcer
C6	Active venous ulcer

Insufficienza Venosa Cronica (I.V.C.)

ALTERAZIONI EMODINAMICHE:

- dilatazione venule collettrici.
- apertura con alterazioni delle A.V.A, dei dispositivi endoarteriolari di blocco e delle microvalvole delle microvenule.
- alterazioni dei linfatici (compenso-scompenso).

ALTERAZIONI MORFOLOGICHE:

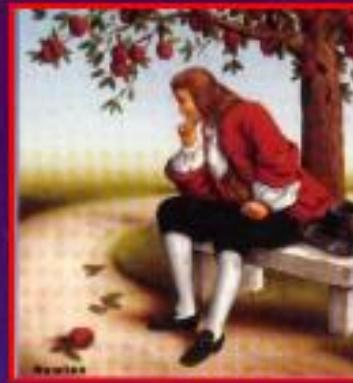
- aumento della permiabilità con slaminamento della M.B.
- trasudazione di liquidi e proteine nell'interstizio (edema interstiziale),
- riduzione diffusione di O₂.
- attivazione dei macrofagi e fibroblasti.
- *farin secca* con effetto barriera.

ALTERAZIONI EMOREOLOGICHE - METABOLICHE:

- scomparsa dell'effetto Farbeus-Lindquist con aumento del microematocrito,
- intrappolamento dei G.R. e G.B (*WHITE TRAPPING CELLS*), eritrodiapedesi, ecc.
- attivazione cellulare con rilascio vari mediatori (fase flogistica).
- eritrodiapedesi con Iron Overload Disease (IOD)

MICROANGIOPATIA DA STASI VENOSA CRONICA

WATERSHED



C3



Venous
oedema
(without trophic
changes)

.....l'influenza della gravità sulla pelle è notevole ed è rilevabile con ultrasuoni ancor prima che sia clinicamente visibile, infatti in un ambiente di microgravità viene dimostrato (Kirsch et al.1993) la possibile variazione del 20% dello spessore della pelle utilizzando 10 MHz., dati ulteriormente confermati con sonde da 20MHz (Diridollou et al.2000)

(Eisenbeiss C et al, British Journal of Dermatology 2001)

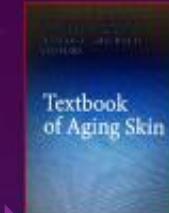
- Kirsch KA, Baartz FJ, Gunga HC, Röcker L. Fluid shifts into and out of superficial tissues under microgravity and terrestrial conditions. Clin Investg. 1993;71(9):687-9.
- Diridollou S, Pavly-Le A, Maillet A et al. Characterisation of gravity-induced facial skin oedema using biophysical measurement techniques. Skin Res Technol 2000; 6: 118-27.

**C3 = Edema senza modificazioni del trofismo cutaneo
ma possibile preludio della distrofia preulcerativa (trophic change skin)!!!**

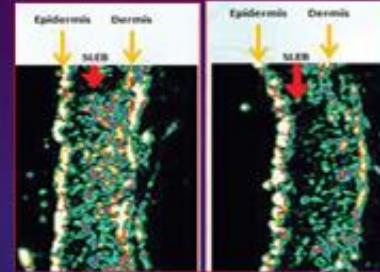
invisible swelling (edema invisibile)



- SLEB = subepidermal-low-echogenic-band
- SENEB = Sub-Epidermal- Non-Echogenic Band
- PPDE = PAPILLARY DERMAL EDEMA
- DE = DERMAL-OEDEMA

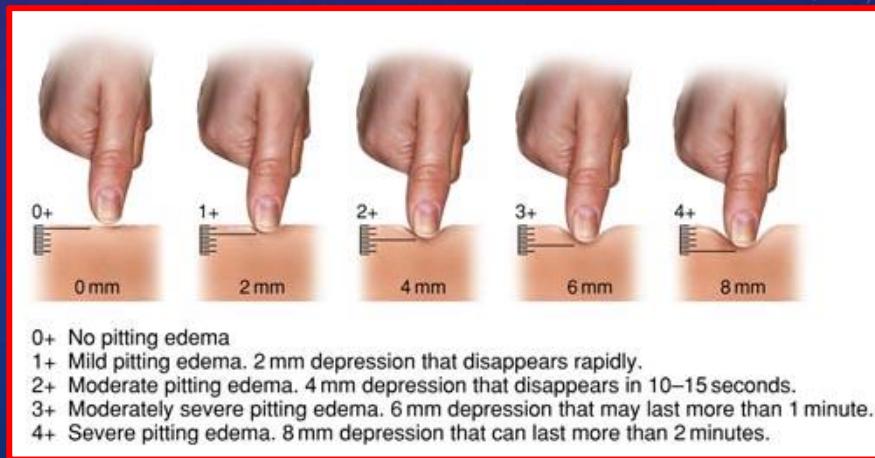


In 1989 de Rigal et al. dimostrò (B-mode- 25MHz) in un campione di 142 femmine (1-90 aa) lo SLEB (**Subepidermal Low Echogenic Band**):



- aumenta con l'età ,**Cronoaging**;
- aumenta nel **Fotoaging**;
- variabilità giornaliera nel 74% di un gruppo di 23 volontari (ages 75 - 100, Med: 89 aa; 17 women, 6 men; Gniadecka M. 1994);
- condizioni pro-edemigene ne aumentano l'espressività (IVC, Linfedema, NYHA 2-3, etc.) alcuni farmaci (calcioantagonisti, alfa-1tici, etc.)

- de Rigal J et al. . Assessment of aging of the human skin by in vivo ultrasonic imaging. J Invest Dermatol 1989; 93: 621-624.
- Gniadecka M et al. . Ultrasound structure and digital image analysis of the subepidermal low echogenic band in aged human skin diurnal changes and interindividual variability. J Invest Dermatol 1994; 102: 362-365.
- Gniadecka M. Dermal oedema in lipodermatosclerosis: distribution, effects of posture and compressive therapy evaluated by high-frequency ultrasonography. Acta Derm Venereol 1995; 75: 120-124.
- Gniadecka M. Localisation of dermal oedema in lipodermatosclerosis, lymphoedema and cardiac insufficiency. J Am Acad Dermatol 1996; 35: 37-41.



- Il tessuto connettivo della cute è fondamentale per lo stoccaggio di acqua nel corpo;
- In un uomo con un peso corporeo di 70 kg tale stoccaggio è di 3-6 lt. e la matrice extracellulare ne trattiene i 2/3 ;
- In soggetti sani nel passaggio orto-clinostasi lo SKIN-THICKNESS pretibiale varia dal 6% (20MHz) -20% (10MHz);
- dopo attività fisica il DERMAL-OEDEMA si riduce;
- cardiac apex-line (al di sopra il derma è più sottile mentre al di sotto è più spesso)
- La riduzione dell'edema degli arti inferiori mediante posizione antideclive richiede almeno 3 ore.

Eisenbeiss et al, British Journal of Dermatology 2001

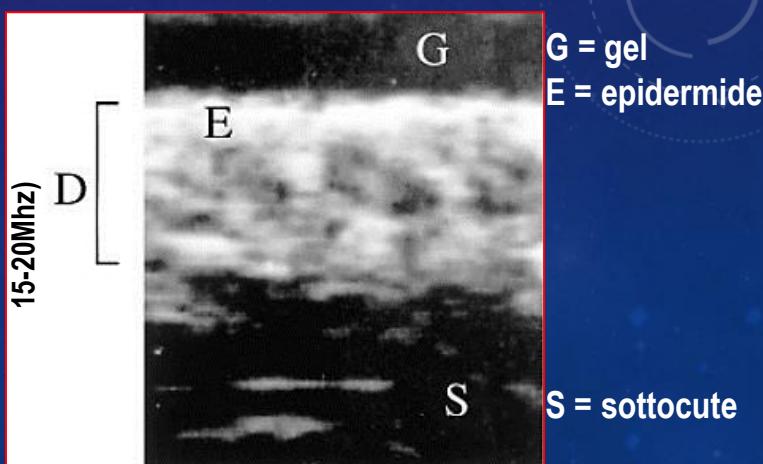
LO SPOSTAMENTO DEI FLUIDI CORPOREI E' VELOCE:

- The volume shift occurs in a very short time. In blood donors it has been demonstrated that 36% of the donated blood was replaced by interstitial fluid in a few minutes (Fogh-Andersen, 1996)...
- In tilt manoeuvres (Kirsch et al.1980) showed that volume shifts within superficial tissues occur in two phases: in the first 5 s after changing position a rapid volume shift occurs, followed by a very slow volume change....
- This results clearly show that fluid shift depends on the position of the body. This is in agreement with measurements in tilt manoeuvres using 10-MHz ultrasound, which gave rise to thinner skin above and thicker skin below the heart apex indifferent point (this is directly below the apex of the heart) while at this point no skin thickness change could be measured.
- The influence of gravity on the skin is detectable by ultrasound even before it is visible.

British Journal of Dermatology 2001; **145**: 590–596.

Dermal fluid translocation is an important determinant of the diurnal variation in human skin thickness

K.TSUKAHARA, Y.TAKEMA, S.MORIWAKI, T.FUJIMURA AND G.IMOKAWA
Biological Science Laboratories, Kao Corporation, 2606 Akabane, Ichikai, Haga, Tochigi 321-3497, Japan



Fogh-Andersen N, Altura BM, Altura BT, Søgaard-Andersen O Changes in plasma ionized calcium and magnesium in blood donors after donation of 450 ml blood. Effects of hemodilution and Donnan equilibrium. Scand J Clin Lab Invest 1996; 56 (Suppl. 224): 245-50.

Kirsch KA, Merke J, Hinghofer-Szalkay H. Fluid volume distribution within superficial soft tissues along body axis during changes of body posture in man. Pflügers Arch 1980; 363: 185-201.

PIGMENTAZIONE EMATO-MELANICA:

C 4a

➤ Klüken N et al Phlebologie, 1983

Is the pigmentation a characteristic sign for chronic venous insufficiency ?

...la pigmentazione spesso accompagna gli stadi avanzati della IVC, tuttavia bisogna considerare che molte dermatosi pigmentogene si sviluppano in assenza di IVC (farmaci, attiniche, flogistiche, endocrine, ematogene ,etc) e talvolta l'IVC può mancare di pigmentazione...

quindi una discromia iperpigmentogena degli arti inferiori può essere sia una manifestazione della IVC che non,

=

vanno ricercati i segni (clinico-strumentali) di IVC

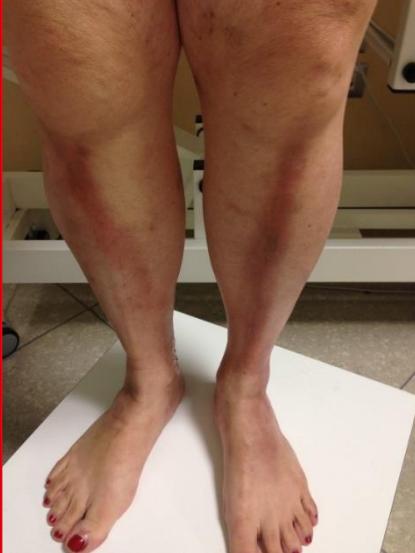
PPPD= Progressive Pigmented Purpuric Dermatosis

➤ Dereure O . American Journal of Clinical Dermatology, 2001

Drug-Induced Skin Pigmentation:Epidemiology, Diagnosis and Treatment



- ✓ il 10-20% delle pigmentazioni cutanee sono post-infiammatorie
- ✓ i meccanismi che inducono ipermelanogenesi sono diversi e complessi (ferromelanine)
- ✓ molti farmaci creano ipermelanosi (calcioantagonisti, antimalarici, amiodarone, tetracicline, metalli, etc.)



Pigmentazione non flebopatico

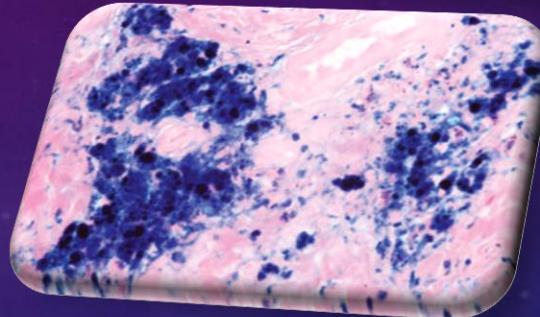


Grosse varici senza evidente discromia

PIGMENTAZIONI EMATO-MELANICHE IN MOLTE DERMOPATIE

stasis dermatitis
folliculitis
psoriasis
trauma
arthropod bite
allergic contact dermatitis
lichen simplex chronicus
senile purpura
vascular ectasia
pretibial pigmented
tinea
lentigo maligna
traumatic fat necrosis
lichen planus
fixed drug eruption , etc etc.

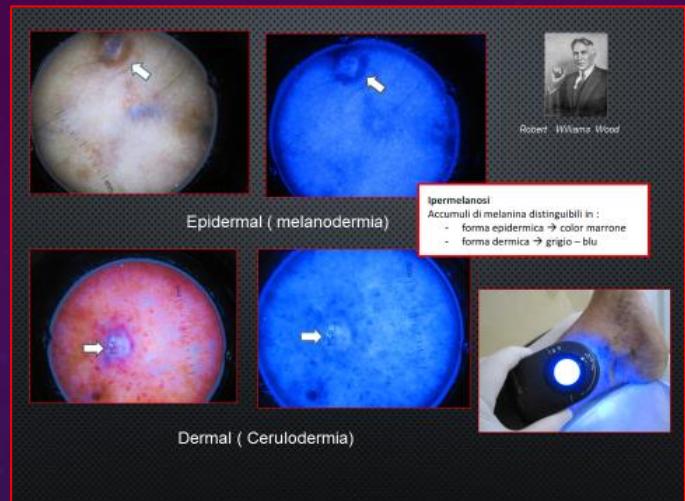
The routine use of iron stain for biopsies of dermatoses of the legs



...of the 100 cases studied, 42 demonstrated (42%) positivity for iron by the Gomori-test..... in conclusion, we have found the routine performance of iron stain on all suspected dermatosis biopsies from the lower extremities to be an efficient and effective protocol....

*An area of future investigation would be the **systematic study** of a wide range of inflammatory skin disorders for the presence of **dermal hemosiderin**.....*

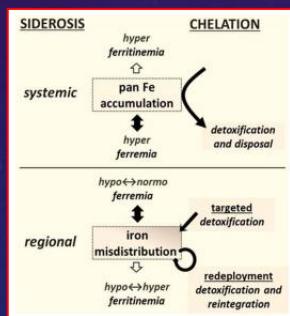
PIGMENTAZIONE PROFONDA (semeologia):



frontiers in
PHARMACOLOGY

REVIEW ARTICLE
published: 31 December 2013
doi: 10.3389/fphar.2013.00167

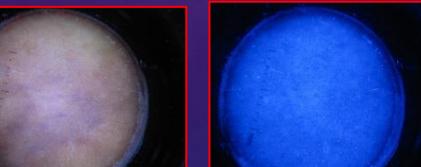
Regional siderosis: a new challenge for iron chelation therapy



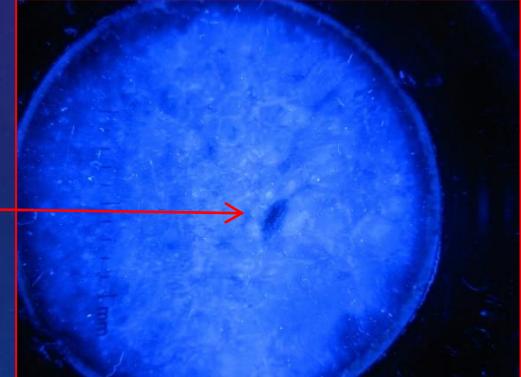
Dismetallosi



Ecchimosi:



Cerulodermia



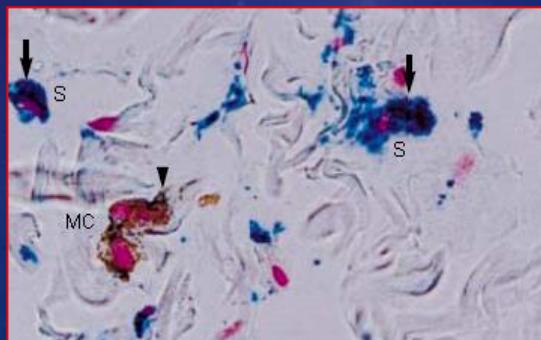
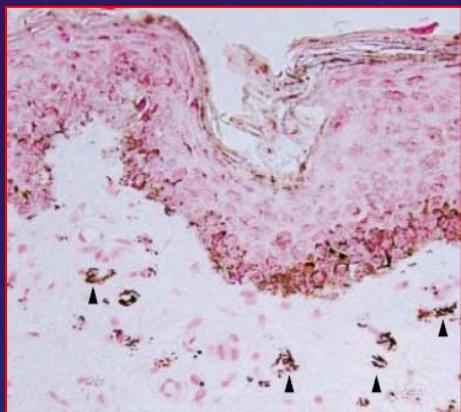
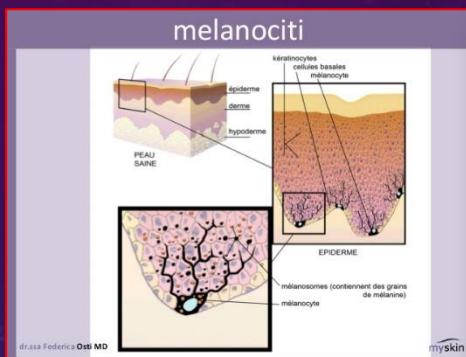
...metals directly alter ALAS (6-aminolevulinate synthetase), activity through their binding at a regulatory site for the synthesis of the enzyme that regulate heme degradation.... haemoglobin is metabolised by haemoxygenase to biliverdin but also haemosiderin.....

Spectrophotometry of bruises, J Clin Pathol 2004

LA SPIEGAZIONE DELLA CERULODERMIA:

Role of Dermal Melanocytes in Cutaneous Pigmentation of Stasis Dermatitis: a histopathological study of 20 Cases

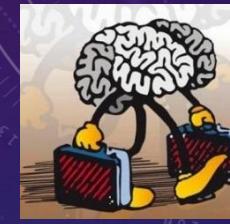
CEAP CLASSIFICATION OF CHRONIC VENOUS DISEASE	
C0	No visible or palpable signs of venous disease
C1	Telangiectasias or reticular veins
C2	Varicose veins
C3	Edema
C4a	Pigmentation or eczema



iperpigmentazione
=
meccanismo di
difesa

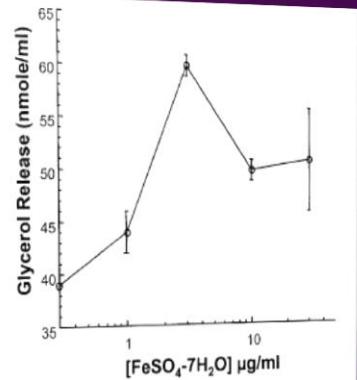
C 4a

Kim D et al, 2002



I melanociti migrano

IRON AND LIPOLYSIS:



C 4a-b

.....adsorption of Fe (III) on melanin in competition with a chelating agent.....

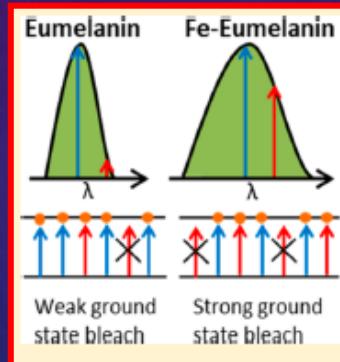
Rumberger J M., Peters T et al.: Transferrin and Iron Contribute to the Lipolytic Effect of Serum in Isolated Adipocytes. *Diabetes*, 2004.

Motolese P: Extracellular iron toxicity as a determinant physiopathological model for so-called "cellulite". *Eur. J. Aesth. Medicine and Dermatology*. 2011.

Tanner LI, Lienhard GE : Localization of transferrin receptors and insulin-like growth factor II receptors in vesicles from 3T3-L1 adipocytes that contain intracellular glucose transporters. *J Cell Biol*. 1989 .

FERROMELANINE:

DIFESA & OFFESA



A reappraisal of Fe(III) adsorption by melanin

Rhiannon Lee Schroeder · Jacobus Petrus Gerber

2014

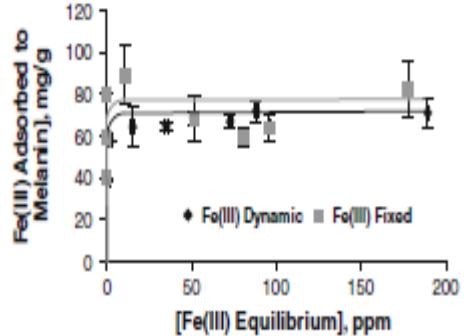


Fig. 1 Adsorption isotherm of Fe(III) for melanin using dynamic and fixed pH

Eczema: what is it? Inflammation of the epidermis



ECZEMA= dal greco ἔκζημα: gonfiarsi

C 4a

ECZEMA:

Eczema è per definizione una reazione infiammatoria irritativa-immunitaria pruriginosa e non contagiosa prevalentemente epidermica.

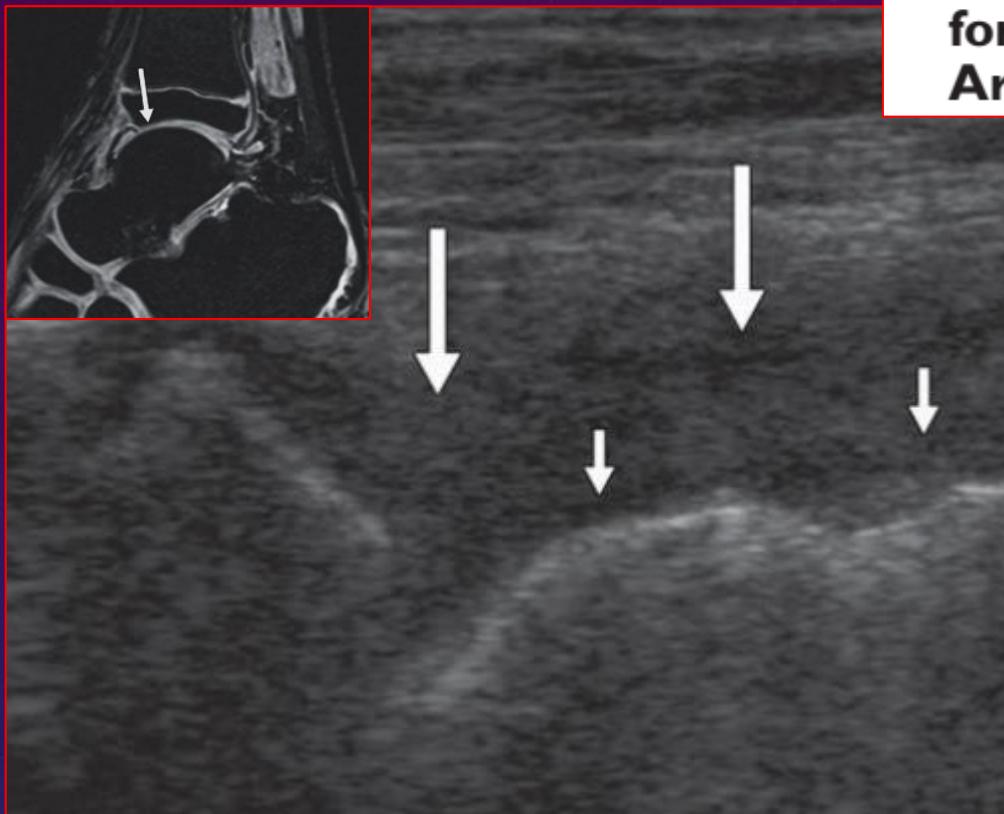
1- l'eczema varicoso è fondamentalmente una forma disidrosica (terapia compressiva) che può trasformarsi in atopica.

Nishizawa A. Dyshidrotic Eczema and Its Relationship to Metal Allergy. Curr Probl Dermatol. 2016;51:80-5.

2- la stasi venosa cronica aumenta il rischio di eczema di circa 3 volte

Lindemayr H, Drobil M. Eczema of the lower leg and contact allergy. Hautarzt. 1985 36(4):227-31.

EMOSIDERINA & ULTRASUONI:



Diagnostic Accuracy of Ultrasound for Assessment of Hemophilic Arthropathy: MRI Correlation

...ultrasound was highly sensitive (> 92%) for assessing synovial hypertrophy and hemosiderin in both ankles and knees but had borderline sensitivity for detecting small amounts of fluid in ankles (70%)....

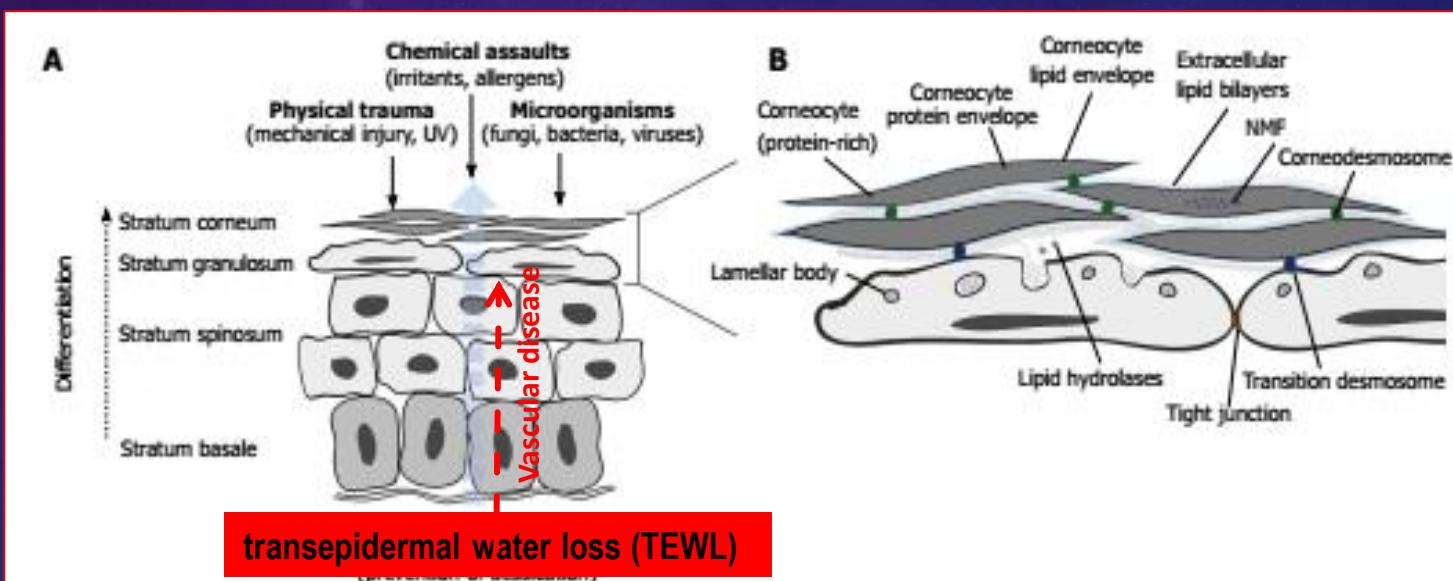
Doria AS et al ;AJR:204,336-49, 2015

Superposition of hemosiderin (hypoechoic, long arrows) to adjacent articular cartilage .

- 17–5-MHz linear-array transducer (Philips Healthcare),
- 11–5-MHz or 14–7-MHz linear-array transducers (Toshiba Medical Systems).
- 1.5-T MRI unit (Excite III 12.0 TwinSpeed, GE Healthcare)

ECZEMA VARICOSEO : semeologia

C 4a



Lipodermatosclerosis (LDS) :

C 4b

.... Lipodermatosclerosis (LDS) has become the most common designation for a fibrosing disorder of the lower extremities in which the legs take the appearance of an “inverted champagne bottle.” Other terms in the literature denoting the same process are *sclerosing panniculitis* and *hypodermatitis sclerodermaformis*.....

- descritta inizialmente da Hurietz nel 1955 come “*Hypodermatitis sclerodermaformis*”.
- Browse, 1977 “*Lipodermatosclerosis o Liposclerosis*”.
- Cantwell, 1979 “*Hypodermatosclerosis sclerodermaformis*”.
- Alegre, 1988, “*lipomembranous change in chronic panniculitis*”.
- Jorizzo, 1991 “*sclerosing panniculitis*”.
- Naschitz, 1996 “*fascitis panniculitis syndromes*”.
- Snow, 1996 “*statis associated lipomembranous panniculitis*”.



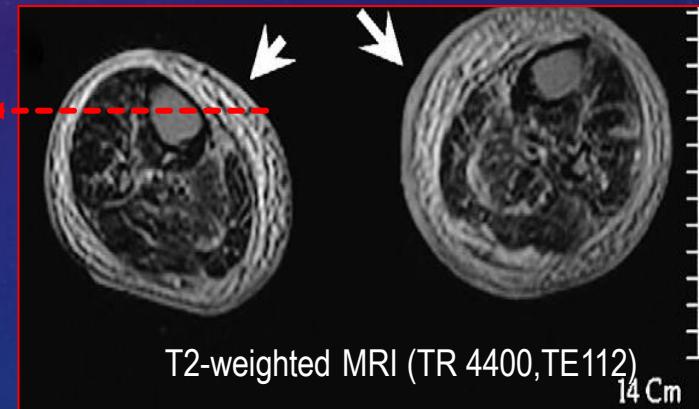
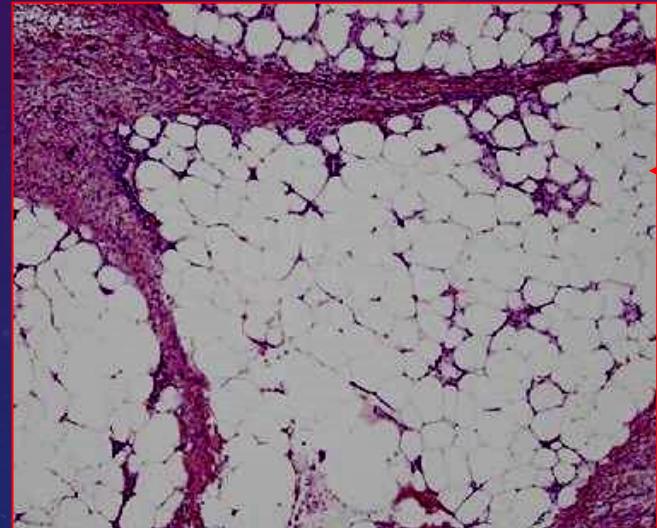
imaging

“ Image biopsy’ by ’ High resolution MRI

....a “characteristic pattern of severe LDS” with High-resolution MRI (1,5 Tesla) is a promising noninvasive method for evaluating cutaneous disease.....



“ HONEYCOMB PATTERN ”



(Chan CC, Yang CY, Chu CY. Magnetic resonance imaging as a Diagnostic tool for extensive lipodermatosclerosis. J Am Acad Dermatol 2008;58:525-7.)

Localization of dermal edema in lipodermatosclerosis, lymphedema, and cardiac insufficiency

High-frequency ultrasound examination of intradermal echogenicity

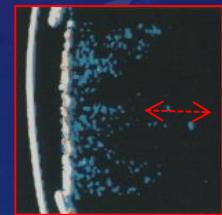
imaging u.s.

SLEB: Subepidermal Low Echogenic Band

➤ LDS = aumento dello SLEB (Papillary- Oedema)



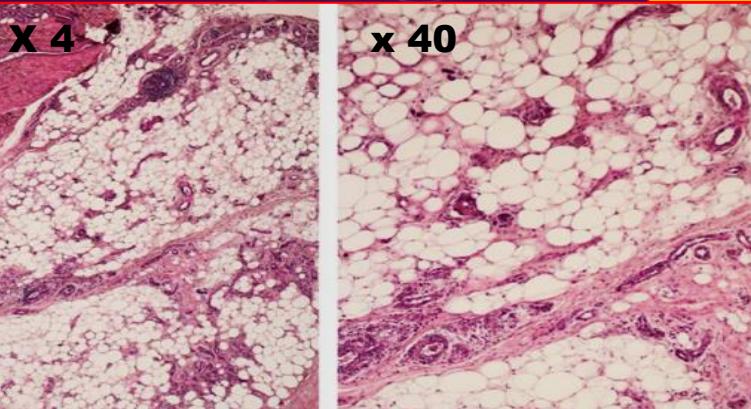
➤ Insufficienza cardiaca= aumento di fluidi nel derma reticolare (derma profondo-Reticular-Oedema)



➤ Linfedema= aumento uniforme a tutto il derma (papillare+reticolare+ipoderma)

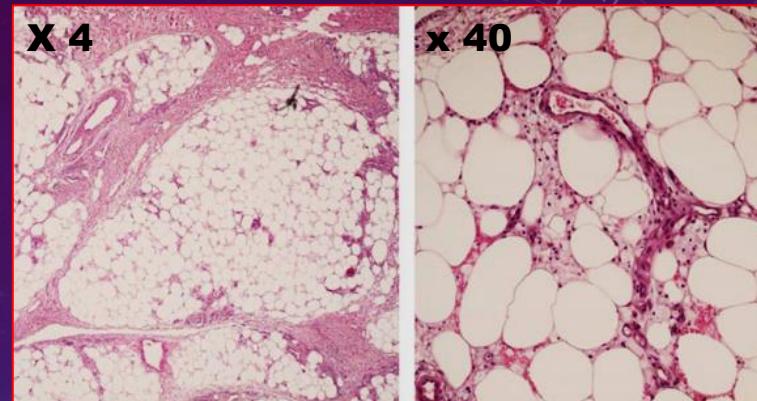


LDS= Panniculite



Acute LDS

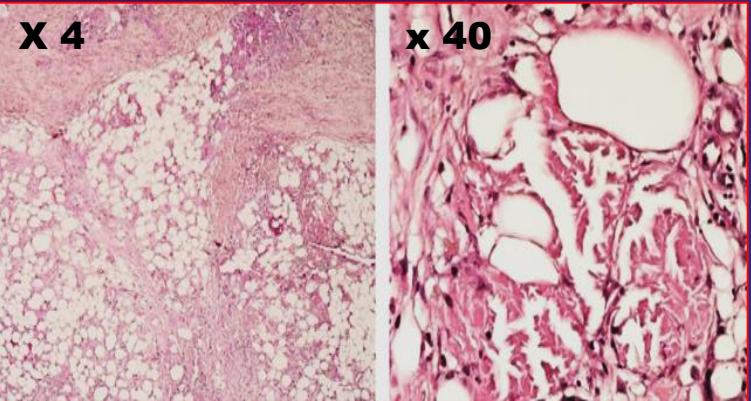
Panniculite settale-lobulare + infiltrati linfocitari settali e necrosi adipocitaria.



Subacute LDS

Setti ispressi + infiltrazione linfocitaria dei setti e lobuli adiposi + vasi adiposi con pareti ispressite.

LDS= forma septo-lobulare di panniculite



Chronic LDS

Setti molto ispressi con fibroplasia + degenerazione lipomembranosa e pseudocisti+ parete dei vasi ipodermici molto ispressiti+ deposizione emosiderinica del derma profondo e soprattutto del sottocute



Lipodermatosclerosis: a clinicopathologic correlation

Charoen Choonhakarn, MD, Suteeraporn Chaowattanapanit, MD, and Narachai Julianon

Histopathological findings	Acute <i>n</i> = 8 (%)	Subacute <i>n</i> = 12 (%)	Chronic <i>n</i> = 5 (%)
Dermis			
Inflammatory infiltrate	+++ (75)	++ (33)	+ (20)
Vascular stasis change	+ (100)	++ (100)	+++ (100)
Siderophage	+ (50)	++ (50)	++ (60)
Fibrosis	+ (25)	++ (33)	+++ (60)
Subcutaneous tissue			
Inflammatory infiltrate	++ (100)	+ (25)	+ (20)
Erythrodiapedesis	+++ (100)	++ (50)	+ (40)
Adipocyte necrosis	++ (100)	+++ (100)	+++ (100)
Lipophages	+ (25)	++ (75)	++ (60)
Lipomembranous change	- (0)	++ (66)	++ (80)
Microcyst formation	+ (75)	++ (100)	++ (100)
Septal fibrosis	+ (50)	++ (75)	+++ (100)
Fat lobule fibrosis	+ (25)	+ (42)	+++ (60)
Vascular stasis change	- (0)	++ (75)	+++ (100)
Iron deposition	- (0)	++ (75)	++ (100)

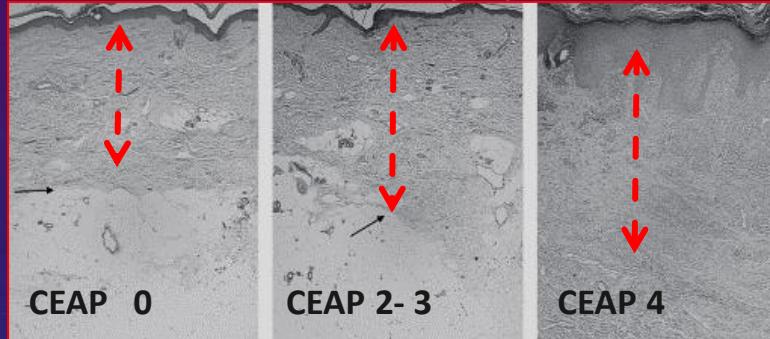
+, mild; ++, moderate; +++, severe.



IN DEFINITIVA:



Skin o Dermal Thickness



Acute

Subacute

Chronic

Erythrodiaapedesis +++

Hemosiderin---

Erythrodiaapedesis ++

Hemosiderin +

Erythrodiaapedesis +

Hemosiderin +++

Coleridge Smith P: The causes of skin damage and leg ulceration in chronic venous disease. Lower Extremity Wounds, 2006

Choonhakam C et al: Lipodermatosclerosis: a clinicopathologic correlation. International Journal of Dermatology, 2016

mindray

FLEBOMEDICA Dr. M. Izzo
20160719-183107-BE40

19/07/2016

18:32:35

AP 97% MI 0.2 TIS 0.0

L14-6s ANGIO

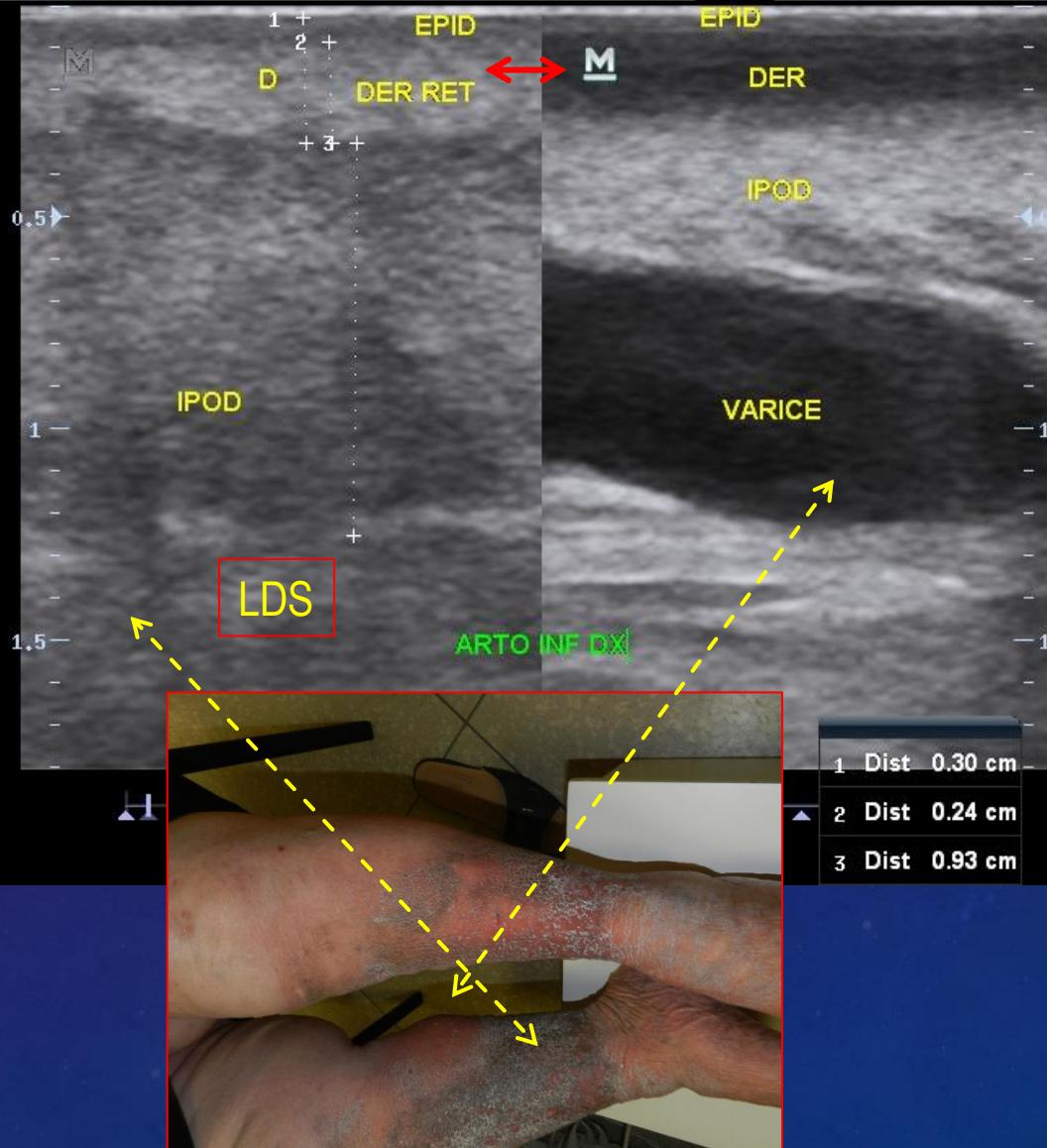
M7

B2

FH11.0 /D1.8

G66 /FR56

IP5 /DR80



M7

B2

FH11.0 /D2.8

G64 /FR26

IP5 /DR80

iTouch /

C

F6.6 /G59

IP5 /WF824

PRF3.6k

21.2

-21.2

echoic rims

anechoic gaps

vertical-sloping anechoic gaps

Il sottocute edematoso aumenta la sua ecogenicità del 141,9% rispetto al sottocute normale (Tassenoy, 2011)

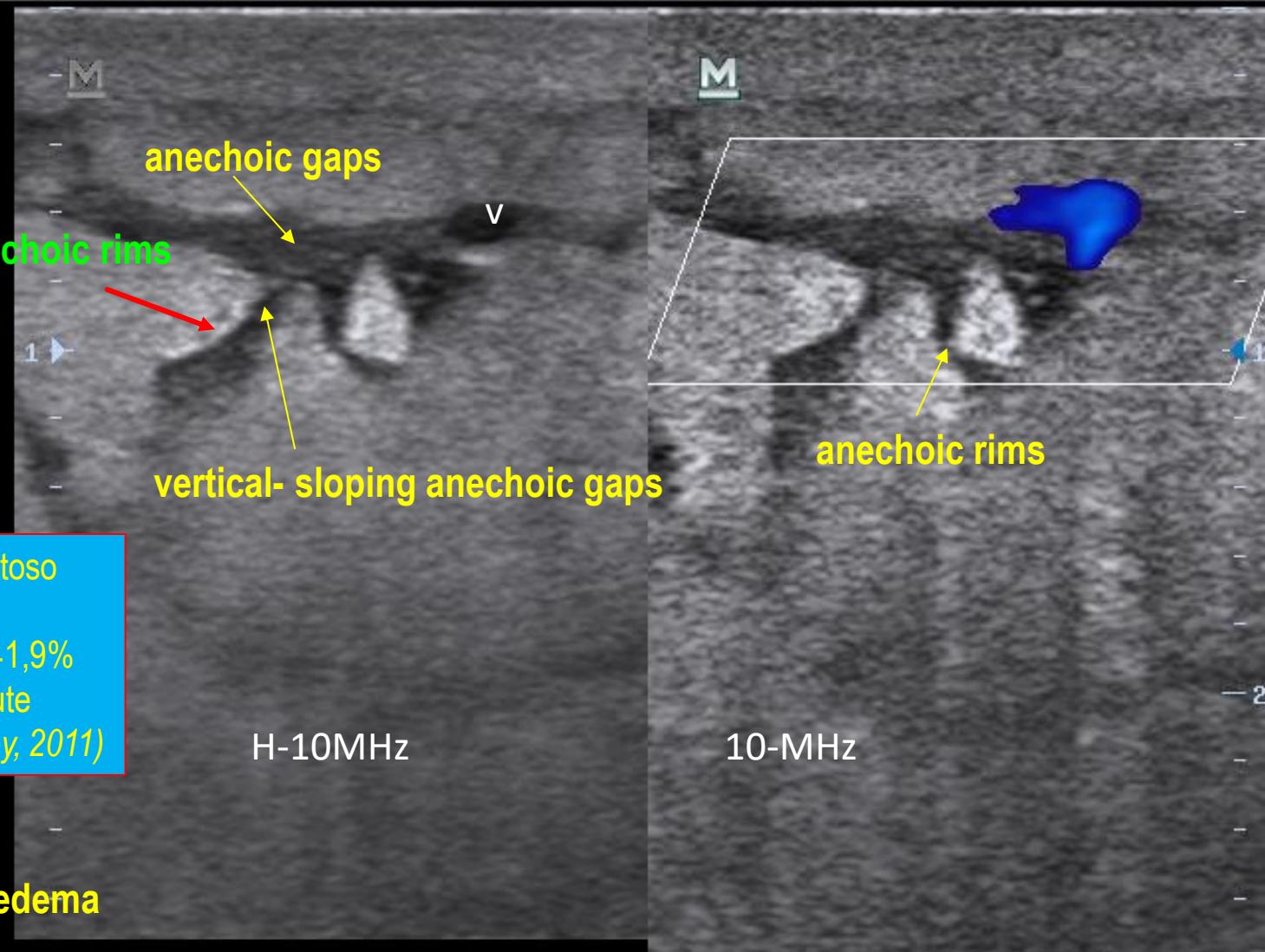
H-10MHz

anechoic rims = edema

echoic rims = fibrosi

179/179

252/252



C 4b

Atrophie Blanche:



Les atrophies cutanées syphilitiques,

Par M. G. MILIAN.

Les affections cutanées atrophiques qui ont été passées en revue et étudiées dans la réunion d'aujourd'hui, sont fort intéressantes par leur symptomatologie, leur anatomie pathologique et leur pathogénie, mais il faut bien admettre que leur étiologie reste absolument obscure, aussi m'a-t-il paru utile de rapporter ici quelques observations d'atrophie cutanée, d'origine connue, qui peuvent servir comme d'introduction à la question d'aujourd'hui. Les atrophies cutanées peuvent être produites par des agents multiples : ceux de la lépre, la tuberculose, la syphilis et d'autres micro-organismes encore. C'est ainsi que nous avons publié un cas d'erythème-sclérose atrophante d'origine tuberculeuse probable (*Société de dermatologie*, 1921, p. 488), mais il existe également des cas d'atrophie d'origine syphilitique, peut-être plus nombreux encore que ceux d'origine tuberculeuse.

C'est pour montrer le pouvoir atrophiant du tréponème dans certains cas de syphilis que j'ai écrit cet article.

C'est Mibelli qui, le premier, a parlé de syphilides atrophiantes. A sa suite, en France, Danlos, Balzer, Hallopeau. Les faits rapportés par ces auteurs sont tous du même ordre. Ce sont des atrophies cutanées, reliquat de lésions syphilitiques secondaires, roséole ou papules, qui, une fois constituées, restent immobiles, sans la moindre tendance à l'extension, comme s'il s'agissait d'une cicatrice. On trouvera ci-dessous les références relatives à ces « vergetures », à ces « leuco-atrophies » de la syphilis secondaire, et il m'apparaît bien que l'anéderdrome de Jadassohn n'est qu'un fait de cet ordre.

Synonyms of atrophie blanche or white atrophy

Nomenclature	Author	Year
Atrophie blanche	Milian ⁴ Wilson ⁵ Maessen-Visch ²⁰	1953 1974 1996
Capillaritis alba	Ellerbroek ⁴ Metz ³	1953 1974
Atrophie Blanche of Milian	van der Molen ⁶	1953
Livedo reticularis with summer ulceration's	Feldaker ⁷	1955
Livedo vasculitis	Bard and Winkelmann ¹⁰	1974
Segmental hyalinizing vasculitis	Bard and Winkelmann ⁸ Pierard and Geerts ⁹	1967 1971
Vasculitis of Atrophie Blanche	Gilliam ¹¹ Schroeter ¹²	1974 1975
PURPLE (painful purpuric ulcers with reticular pattern of the lower extremities)	Milstone ¹³	1983
(Livedo) Vasculopathy	Shornick ¹⁴ McCalmon ¹⁵	1983 1992

- Milian G. *Les atrophies cutanées syphilitiques*

Bulletin de la Société française de dermatologie et de syphiligraphie ;1929, 865-71.

- Ryan T & Burnand K. Diseases of the Veins and Arteries. In: Champion RH, Burton JL, Burns DA & Breathnach SM (eds). *Textbook of Dermatology*. 6th edn. Blackwell Science Inc, 1998, pp. 2248-9.

- Sreedharan S & Sinha S. *Atrophie blanche Wound Practice and Research*. 2011 Vol 19 ; 2 – 74-80

LE COSE CAMBIANO:

Condizioni cliniche in cui può essere presente AB:

Shornick et al, 1983	Sreedharan and Sinha, 2011
Arteriosclerosis	Antiphospholipid syndrome
Diabetes	Chronic myelogenous leukaemia
Dysproteinæmia	Chronic venous insufficiency
Hypertension	Collagen vascular disease
Rheumatoid arthritis	Cryoglobulinaemia
Stasis dermatitis	Lymphoma
Systemic lupus erythematosus	Polyarteritis nodosa
	Scleroderma
	Sneddon's syndrome
	Systemic lupus erythematosus
	Thalassaemia minor
	Venous stasis

Aetiology and management
of atrophie blanche
in chronic venous insufficiency

Treatment	Explanation
Compression therapy ¹	Co-existing venous disease (in the absence of arterial disease) requires the use of multi-component compression therapy
Vasodilators ¹	Dipyridamole 75 mg, 4 times a day; duration: 3–6 weeks
Treatment of neuropathic component ¹	Tricyclics (e.g. amitriptyline): single dose at night, starting with 10–30 mg ¹ Gabapentin, pregabalin, or carbamazepine can also be added in increasing, but divided, daily doses
Hyperbaric oxygen therapy ^{1, 2}	Once daily; duration: 15 sessions

Atrophie Blanche:

← Problems

- **Nei casi in cui all'eczema varicoso si associa l'atrophie blanche (AB) senza ulcerazioni attive o pregresse e senza LDS è sempre un CEAP-C 4b ????**
- **la vasculite livenoide è un sinonimo di AB o una condizione diversa ???**
- **un pz. In CEAP. C 2 con neuropatia che sviluppa una AB, come va stadiato???**



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- Grey J E et al: Venous and arterial leg ulcers; BMJ 2006, vol 332 ;347-350.
- Alavi A et al. Atrophie blanche: is it associated with venous disease or livedoid vasculopathy? Adv Skin Wound Care. 2014 ;27(11):518-24.
- Tubone MQ et al. Livedoid vasculopathy associated with peripheral neuropathy.. An Bras Dermatol. 2013;88(6 Suppl 1):227-9

Risk factors for chronic ulceration in patients with varicose veins: A case control study



Rischio ulcerezione

Skin change e altri fattori:

- **Lipodermatosclerosi (LDS)-atrofia bianca**
- **Corona flebectasica**
- **Eczema**
- **BMI alto**
- **Efficacia delle pompe venose (motilità articolare)**
- **Reflusso venoso profondo (TVP)**
- **Fumo**

The biomechanics of leg ulceration

Anthony Chant MS FRCS

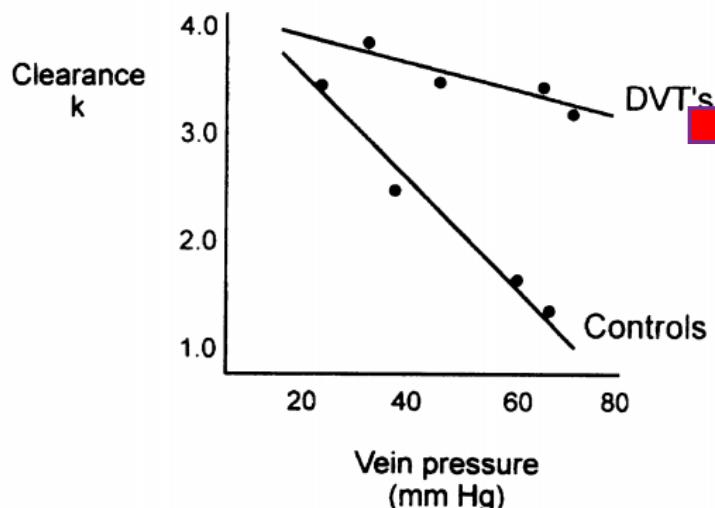
Hunterian Professor/Consultant Vascular Surgeon/Hon Senior Lecturer

Department of Vascular Surgery, Southampton University Hospitals

....si può osservare che l'edema può determinare una chiusura intermittente dei capillari con successivo danno da riperefusione , ciò è particolarmente evidente nelle aree limitrofe all'ulcera....

(Chant, 1999)

- Utilizzando l'isotopo Na-24 iniettato nella cute e analizzando la curva di clearance si ottiene la valutazione della ossigenazione cutanea :



nei pazienti con edema venoso nel passaggio clino-ortostasi all'aumento della pressione venosa non si ottiene un aumento della clearance del Na-24

edema,edema,edema.....

Figure 1. Clearance (k) of ^{24}Na as a measure of venous function with increasing venous pressure produced by postural change; clearance reduces dramatically in controls but not in patients with venous oedema.

C5-C6

Dermal oedema assessed by high frequency ultrasound in venous leg ulcers

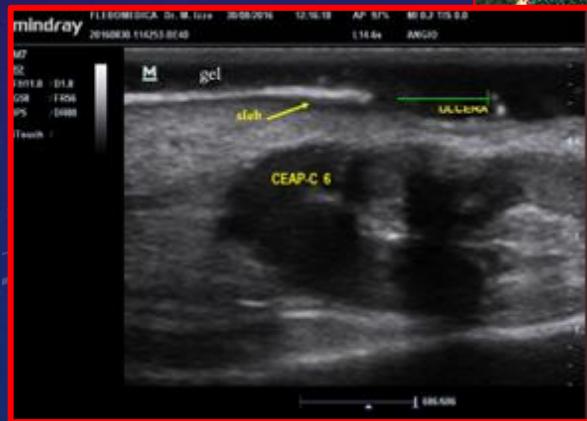
D.HU, T.T.PHAN, G.W.CHERRY AND T.J.RYAN

Wound Healing Institute, Department of Dermatology, The Churchill Hospital, Oxford OX3 7JL, UK.

C5-C6



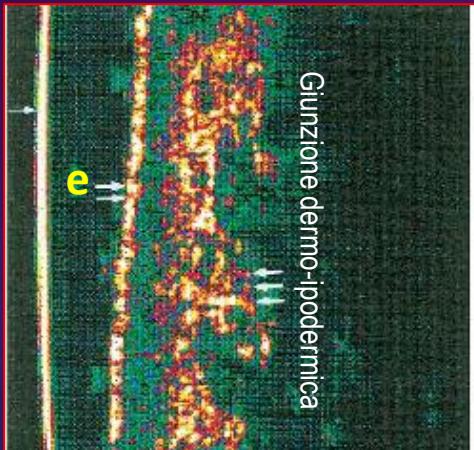
*La principale sede
dell'edema è il derma
papillare = SLEB*



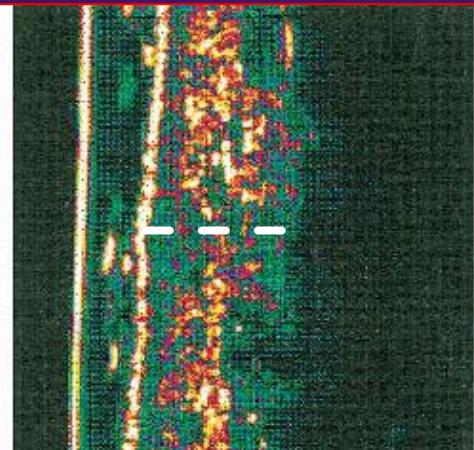
*...anche nelle ulcere venose la sede di
stoccaggio dei fluidi (edema) è il derma.....*

SENZA ULCERE VENOSE:

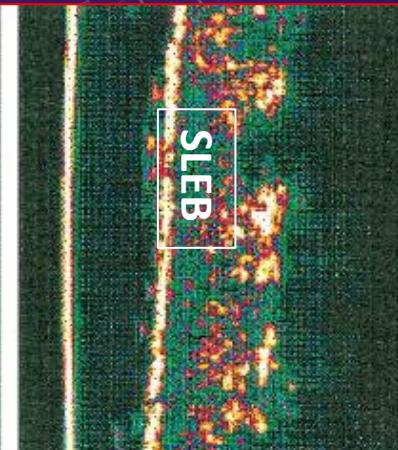
3 super. Gamba



3 medio gamba

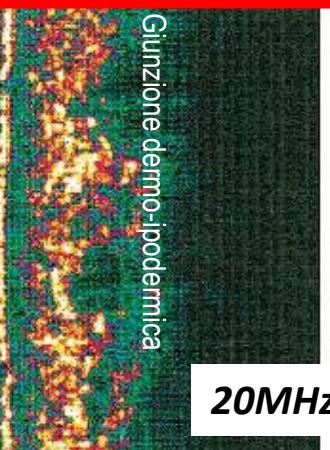


3 inf. gamba

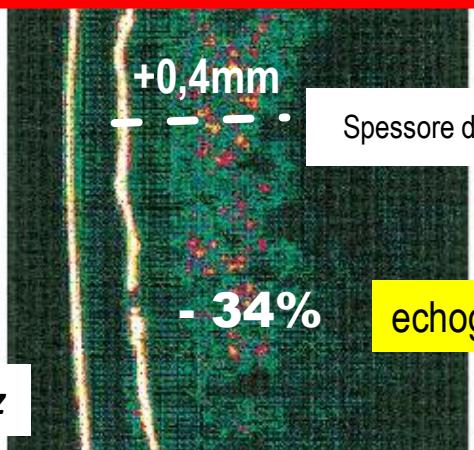


CON ULCERE VENOSE:

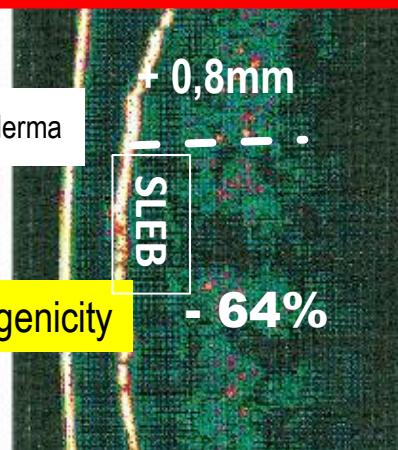
3 super. Gamba



3 medio gamba



3 inf. gamba



The colour scale of echogenicity is: white > yellow > red > green > blue > black



Grazie per
l'attenzione

Marcello Izzo