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EMOCOMPONENTI AD USO NON TRASFUSIONALE: STATO DELL'ARTE E SVILUPPI FUTURI

21 GENNAIO 2020

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SICPRE

Società Italiana di Chirurgia Plastica Ricostruttiva-rigenerativa ed Estetica

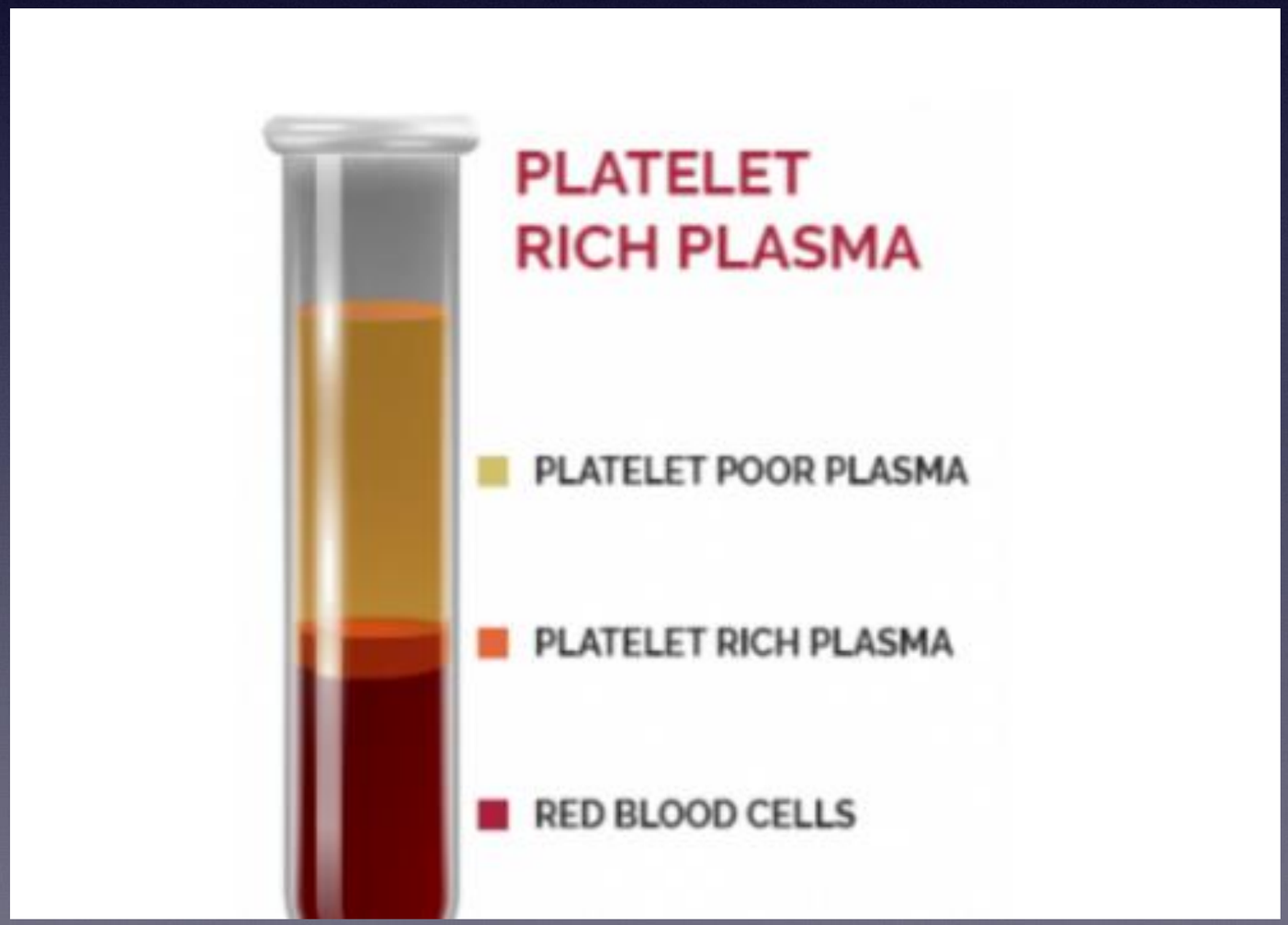
La Sicpre è la casa dei Chirurghi Plastici Specialisti

Il punto di vista della SICPRE

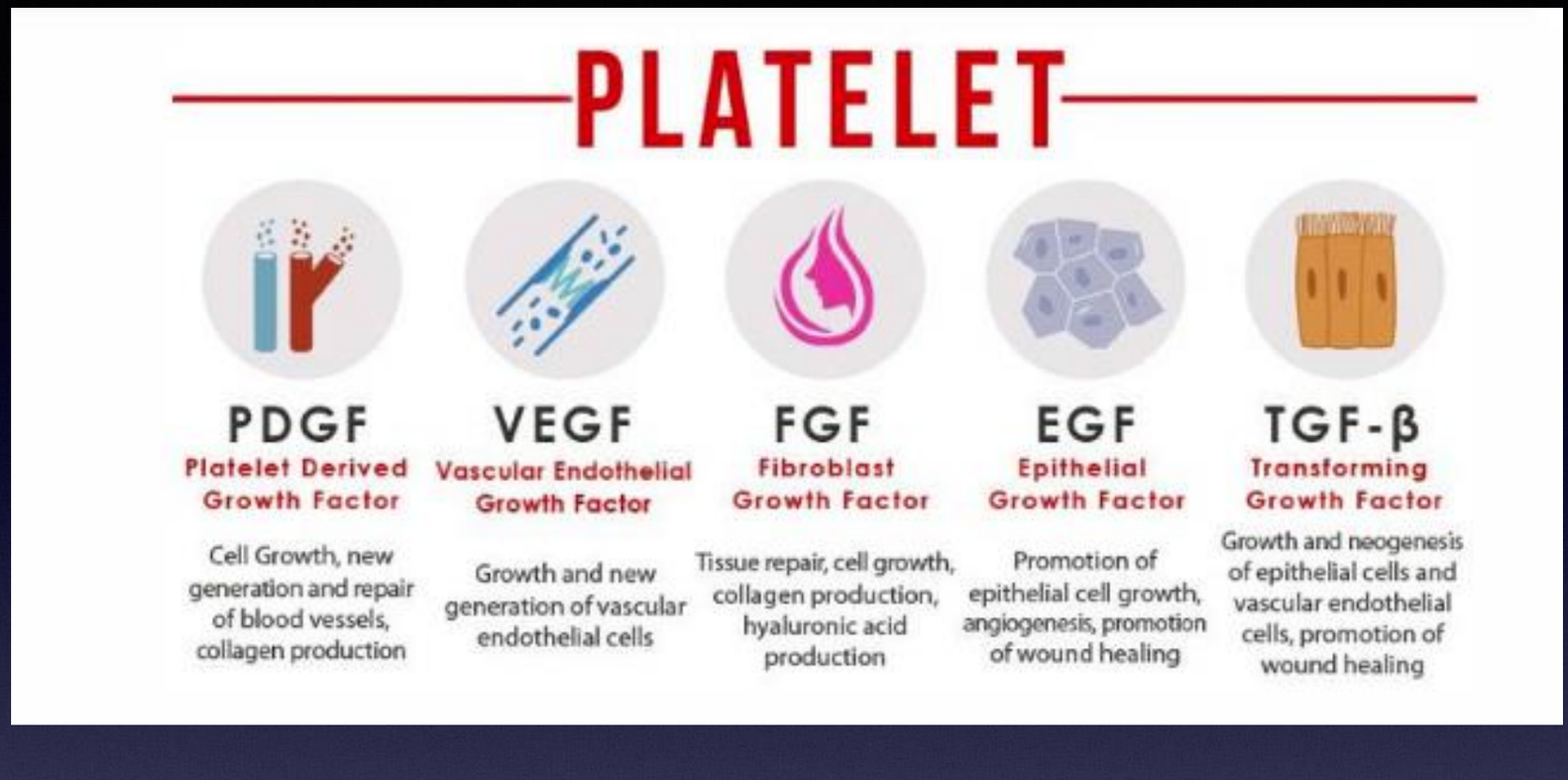
Dott. Carlo Magliocca

Platelet-Rich-Plasma

- E’ un emocomponente per uso non trasfusionale allo stato liquido, costituito da plasma e piastrine concentrate



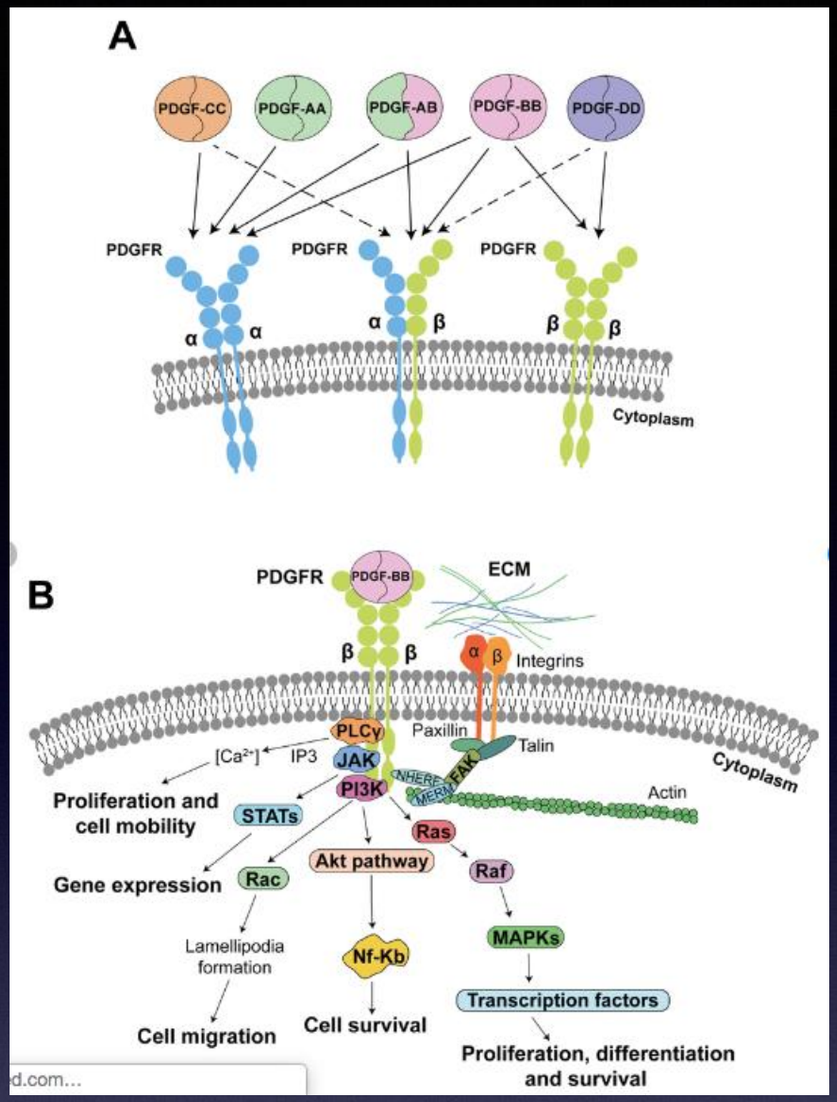
Platelet-Rich-Plasma



- E’ efficace come adiuvante e potenziante i naturali processi rigenerativi e riparativi dei tessuti. Gli effetti sono legati principalmente al **lento e costante rilascio locale di fattori di crescita (GROWTH FACTORS), contenuti nei granuli alfa delle piastrine**.

- I GFs una volta escreti per attivazione delle piastrine a contatto con i tessuti durante il processo di emostasi, **si legano a specifici recettori che inducono proliferazione cellulare nei fibroblasti, nelle cellule endoteliali e negli osteoblasti**. Stimolano inoltre la sintesi di matrice extracellulare e la chemiotassi di macrofagi e monociti. Un ruolo non secondario sembrano avere le macromolecole della matrice extracellulare (fibronectina, ac.ialuronico) che costituisono l’impalcatura necessaria per la migrazione cellulare

Growth-Factors



Platelet Derived GF *esplica azione mitogena e angiogenica e regola l'azione di altri fattori di crescita:*

- **TGF-beta (Trasforming Growth Factor-beta)** che ha azione chemiotattica, di stimolazione dei fibroblasti e degli osteoblasti e inibente sugli osteoclasti
- **IGF I e II (Insuline Like Growth Factor I e II)** con azione prevalente sugli osteoblasti
- **EGF (Epidermal Growth Factor)** che stimola le cellule epiteliali e connettivali
- **VEGF (Vascular Endothelial Growth Factor)** fattore angiogenico e stimolante le cellule endoteliali
- **FGF (Fibroblast Growth Factor)** con azione stimolante sui fibroblasti

PRIMA CRITICITA’

- Il risultato clinico della terapia con PRP dipende in buona misura dalla quantità dei fattori di crescita contenuti nel prodotto e che i fattori di crescita sono in stretta correlazione con il numero di piastrine presenti nel PRP

Concentrazione piastrinica : 1 X 10^6/ 20%

Indicazioni all'utilizzo di emocomponenti per uso non trasfusionale

Gruppo multidisciplinare

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HCT/P Regulation - 351 vs 361 Products

Criteria for Regulation as a Section 361 HCT/P

- **An HCT/P is regulated solely under Sec. 361 of the PHSA if it meets all of the following criteria:**
  - The HCT/P is minimally manipulated;
  - The HCT/P is intended for homologous use only;
  - The manufacture of the HCT/P does not involve the combination of the cells or tissues with another article, except for water, crystalloids, or a sterilizing, preserving, or storage; and either:
  - (i) the HCT/P does not have a systemic effect and is not dependent upon the metabolic activity of living cells for its primary function; or (ii) the HCT/P has a systemic effect or is dependent upon the metabolic activity of living cells for its primary function, and (a) is for autologous use; (b) is for allogeneic use in a first-degree or second-degree blood relative; or (c) is for reproductive use.

Examples of HCT/P's Regulated Solely under Section 361

Bone (incl. demineralized bone)	Ligaments
Tendons	Fascia
Cartilage	Ocular tissue
Skin	Veins and arteries (not from preserved umbilical cords)
Pericardium	Amniotic membrane (for ocular repair)
Dura matter	Heart valve allografts
Hematopoietic stem cells derived from peripheral or umbilical cord blood	Reproductive Cells (Semen, Oocytes)
Embryos	

HCT/P Regulation - 351 vs 361 Products

Biologics Regulated under Section 351 of the PHS Act and/or the FD&C Act

- **Examples of products FDA has determined do not meet all of the criteria in 21 CFR 1271.10(a) and are regulated as drugs and/or biological products:**
  - CULTURED CARTILAGE CELLS
  - CULTURED NERVE CELLS
  - LYMPHOCYTE IMMUNE THERAPY
  - GENE THERAPY PRODUCTS
  - HUMAN CLONING
  - HUMAN CELLS USED IN THERAPY INVOLVING THE TRANSFER OF GENETIC MATERIAL (cell nuclei, oocyte nuclei, mitochondrial genetic material in ooplasm, genetic material contained in a genetic vector)
  - UNRELATED ALLOGENEIC HEMATOPOIETIC STEM CELLS
  - UNRELATED DONOR LYPHOCYTES FOR INFUSION

Necessitano di trials per poter essere approvati per l'utilizzo clinico

Indicazioni all'utilizzo di emocomponenti per uso non trasfusionale

Gruppo multidisciplinare

TABELLA DELLE INDICAZIONI CON GRADO DI RACCOMANDAZIONE

ULCERE DIABETICHE (per ciclo di trattamento corrispondente a 12 applicazioni)	1B
ULCERE E FERITE DI DIFFICILE GUARIGIONE	1B
TRATTAMENTO DELLE OSTEOARTROSI (per ciclo di trattamento corrispondente a 3 applicazioni)	1B
RICOSTRUZIONE TENDINE CROCIATO ANTERIORE	2B
TRATTAMENTO DELLA PSEUDOARTROSI	2B
TRATTAMENTO DELLA TENDINOPATIA ROTULEA	2B
TRATTAMENTO INFILTRATIVO DELLE EPICONDILITI	2B
TRATTAMENTO DELLE LESIONI DEL LEGAMENTO CROCIATO ANTERIORE	2B
TRATTAMENTO DELLE LESIONI DEL TENDINE DI ACHILLE	2B
ALTRE PATOLOGIE OSTEO-MUSCOLARI LIGAMENTOSE	2B
SINDROME DELL'OCCHIO SECCO	2B
LESIONI, ULCERE DELLA SUPERFICIE CORNEALE	2B
USTIONI DELLA SUPERFICIE OCULARE	2B
TRATTAMENTO DEL RIALZO DEL SENO MASCELLARE	2B
RIGENERAZIONE PERIDONTALE	2B
TRATTAMENTO COADIUVANTE LA GUARIGIONE DELL'ALVEOLO POSTESTRATTIVO	2B
TRATTAMENTO COADIUVANTE I PROCESSI DI GUARIGIONE DOPO CHIRURGIA ESTRATTIVA E IMPLANTARE NEI PAZIENTI CON PATOLOGIE SISTEMICHE	2B
INTERVENTO DI CHIRURGIA ORALE (ESTRAZIONE DENTI INCLUSI, EXERESI LESIONI CISTICHE) PER PROMUOVERE L'EPITELIZZAZIONE DELLE FERITE E ACCELERARE LA FORMAZIONE DEL SIGILLO MUCOSO	2B
INTERVENTI DI CHIRURGIA ORALE IN PAZIENTI IN TERAPIA CON BIFOSFONATI ENDOVENA ED ANTIANGIOGENETICI	2B
EXERESI CHIRURGICA DI MRONJ	2B
INTERVENTI DI IMPLANTOLOGIA	2B
INTERVENTI DI INNESTI OSSEI E RIGENERAZIONE COME SUPPORTO ALLA INNESTO	2B
TRATTAMENTO DI CICATRICI PATOLOGICHE	2B
TRATTAMENTO DELL'ALOPECIA ANDROGENETICA IN FASE INIZIALE	2B
TRATTAMENTO DELL'ALOPECIA AREATA IN FASE INIZIALE	2B
RIGENERAZIONE DEL DISCO INTERVERTEBRALE	2C
TRATTAMENTO DEGLI ESITI DELLE CICATRICI DA ACNE	2C

1. Indicazioni cliniche all'utilizzo **appropriato** di emocomponenti per uso non trasfusionale basate su **raccomandazioni forti.**
   - Indicazioni cliniche con **grado di raccomandazione 1B** (Tabella I, Appendice 1): raccomandazione forte con chiara evidenza del rapporto rischio/beneficio, probabilmente applicabile alla maggior parte dei pazienti.

2. Indicazioni cliniche all'utilizzo di emocomponenti per uso non trasfusionale basate su **raccomandazioni deboli**.
   - Indicazioni cliniche con **grado di raccomandazione 2B** (Tabella I, Appendice 1): raccomandazione debole con incerta evidenza del rapporto rischio/beneficio; approcci alternativi probabilmente sono migliori in certi pazienti e in certe circostanze.

3. Indicazioni cliniche all'utilizzo di emocomponenti per uso non trasfusionale basate su **raccomandazioni molto deboli**.
   - Indicazioni cliniche con **grado di raccomandazione 2C** (Tabella I, Appendice 1): raccomandazione molto debole con incerta evidenza del rapporto rischio/beneficio; altre scelte possono essere ugualmente ragionevoli.

Indicazioni all'utilizzo di emocomponenti per uso non trasfusionale

Gruppo multidisciplinare

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Nuove applicazioni
Fat graft + PRP

Razionale :

- **Aumentare la percentuale di attecchimento del grasso**
- **Aumentare la vascolarizzazione e la densità cellulare del tessuto adiposo innestato.**

Nella nostra esperienza utilizzato in chirurgia estetica, guarigione delle ferite chirurgiche, atrofia vulvo-vaginale, nella ricostruzione della mammella, nella bonifica degli esiti radioterapici

Concentrazione ottimale:
40 ml di PRP in 100 cc di tessuto adiposo

ORIGINAL ARTICLE

IWJ WILEY

Wound-healing effect of adipose stem cell-derived extracellular matrix sheet on full-thickness skin defect rat model: Histological and immunohistochemical study

Yoon J. Lee[1] | Seung E. Baek[2] | Sujin Lee[2] | Yeon J. Jeong[1] | Ki J. Kim[2] | Young J. Jun[2] | Jong W. Rhie[2]

- Microscopia elettronica
- Immunofluorescenza
- GF e Contenuto proteine
- Quantificazione DNA

In vivo: applicato su ulcera di 2 cm di diametro su schiena ratto

Esame istopatologico:
grado di riepitelizzazione,
deposizione di collagene

Immunistochimica : espressione CD31

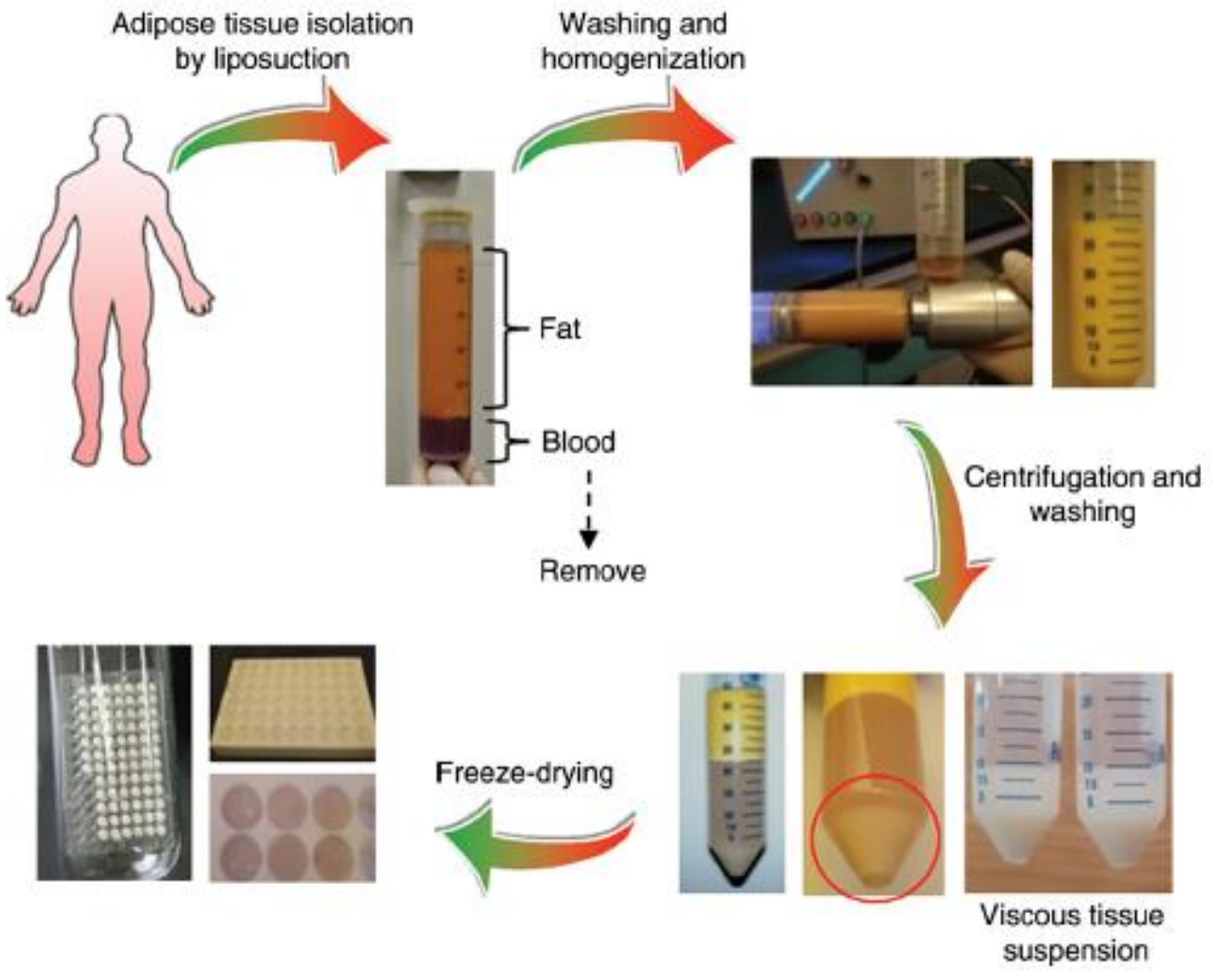


FIGURE 1 Schematic representation of the fabrication process used to prepare extracellular matrix (ECM) sheets from human adipose tissue

ORIGINAL ARTICLE

IWJ WILEY

Wound-healing effect of adipose stem cell-derived extracellular matrix sheet on full-thickness skin defect rat model: Histological and immunohistochemical study

Yoon J. Lee[1] | Seung E. Baek[2] | Sujin Lee[2] | Yeon J. Jeong[1] | Ki J. Kim[2] | Young J. Jun[2] | Jong W. Rhie[2]

- In questo studio sono state ottenute cellule staminali dal tessuto adiposo umano. Il tessuto adiposo prelevato è stato lavato ed omogenizzato. Successivamente è stato di nuovo lavato e poi centrifugato. Infine la sospensione viscosa presente sul fondo è stata liofilizzata ottenendo un foglio di matrice extracellulare.

- La matrice extracellulare è stata utilizzata in un gruppo di ratti (gruppo numero 3) su un ulcera dorsale di 2 cm di diametro.

- Risultati sono stati analizzati: clinica, esame istologico, immunoistochimica (espressione CD31). Cio che è stato valutato è il grado di riepitelizzazione, la produzione di nuovo collagene, la neoangiogenesi ed infine la guarigione in vivo.

IWJ WILEY

ORIGINAL ARTICLE

Wound-healing effect of adipose stem cell-derived extracellular matrix sheet on full-thickness skin defect rat model: Histological and immunohistochemical study

Yoon J. Lee[1] | Seung E. Baek[2] | Sujin Lee[2] | Yeon J. Jeong[1] | Ki J. Kim[2] | Young J. Jun[2] | Jong W. Rhie[2]

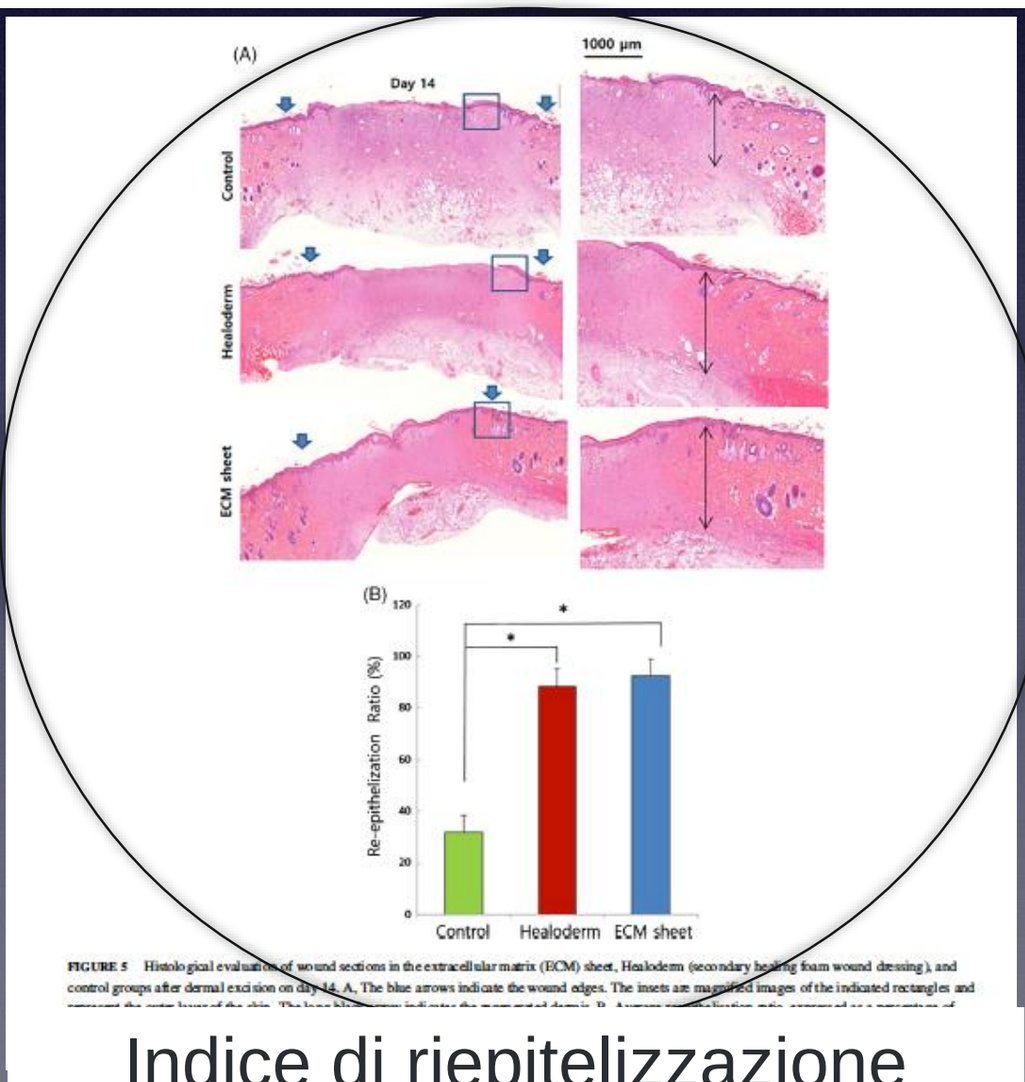
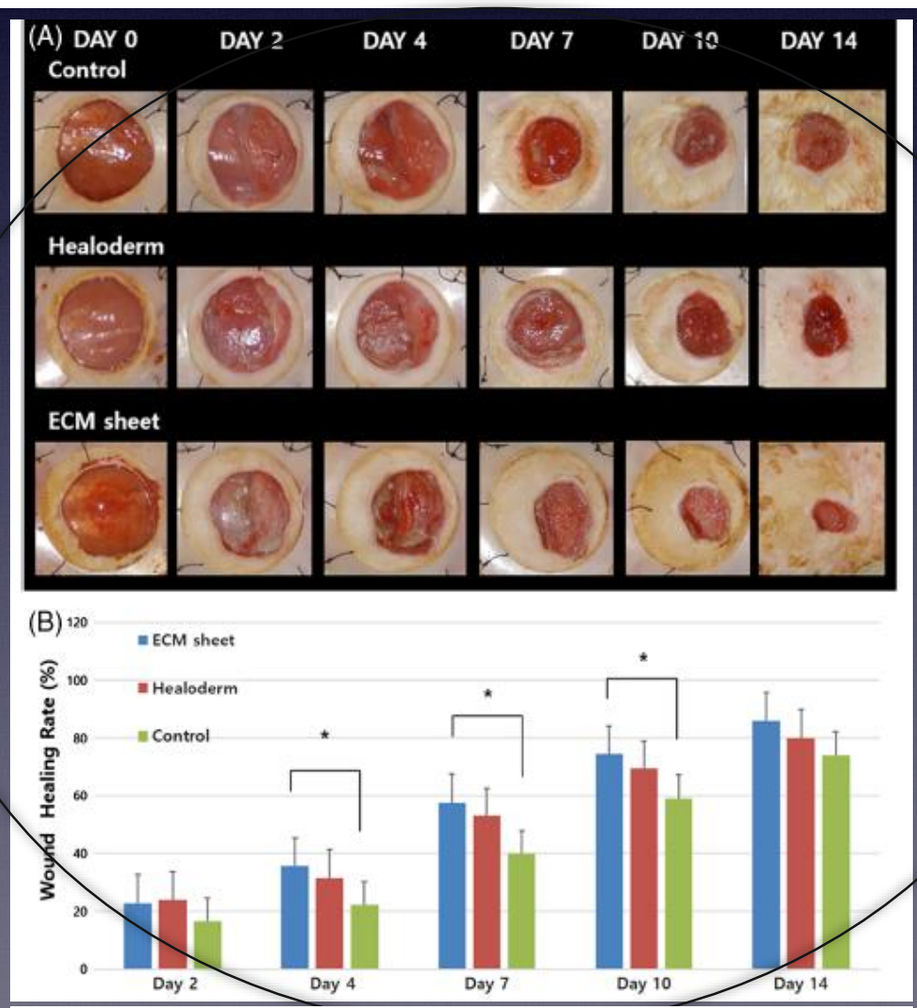


FIGURE 5 Histological evaluation of wound sections in the extracellular matrix (ECM) sheet, Healoderm (secondary healing foam wound dressing), and control groups after dermal excision on day 14. A, The blue arrows indicate the wound edges. The insets are magnified images of the indicated rectangles and

Indice di riepitelizzazione



Tasso di guarigione dell'ulcera

ORIGINAL ARTICLE

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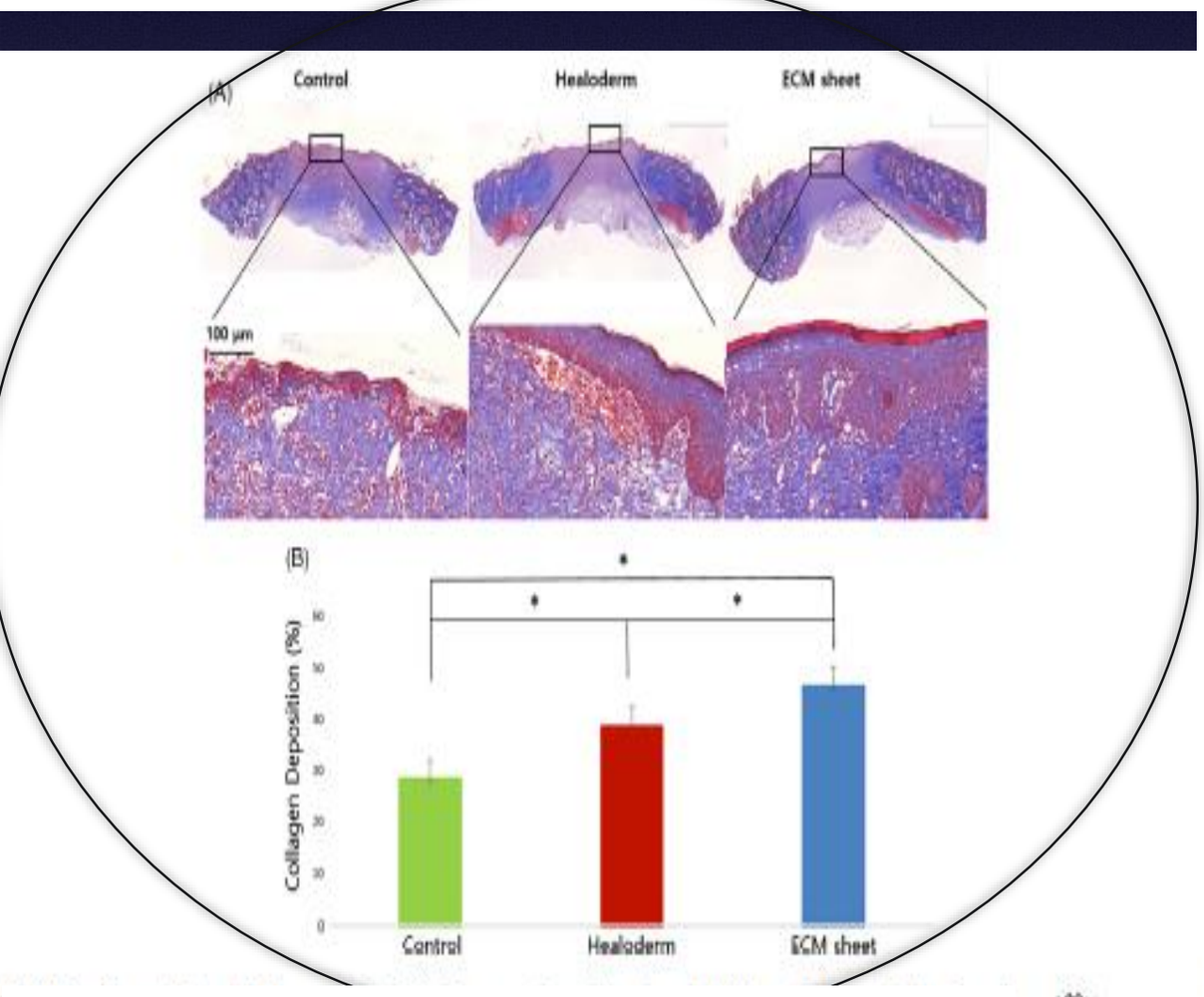
Yoon J. Lee[1] | Seung E. Baek[2] | Sujin Lee[2] | Yeon J. Jeong[1] | Ki J. Kim[2] | Young J. Jun[2] | Jong W. Rhie[2]



produzione nuovo collagene

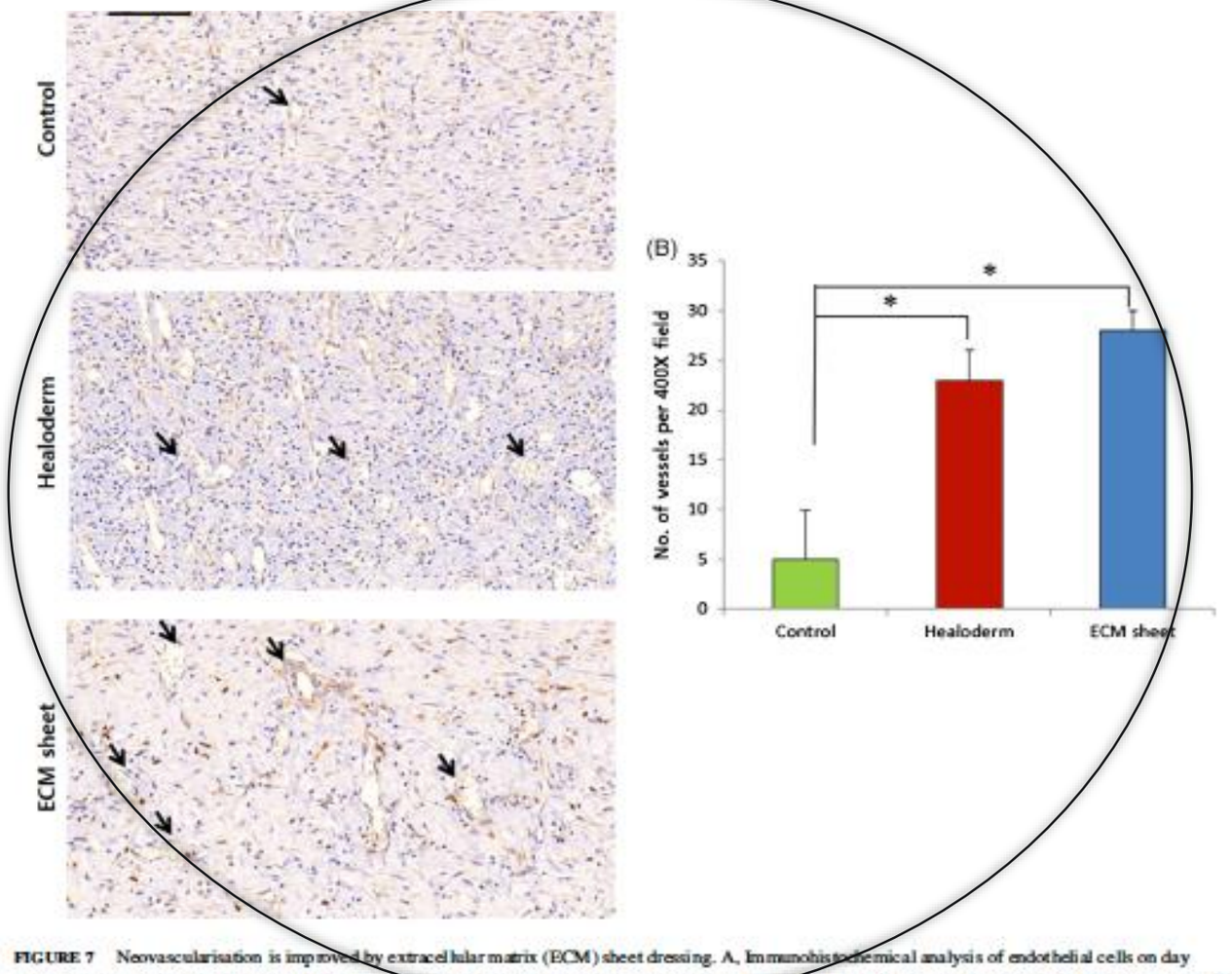


FIGURE 7 Neovascularisation is improved by extracellular matrix (ECM) sheet dressing. A, Immunohistochemical analysis of endothelial cells on day 14 after wound

neoangiogenesi

European Journal of Plastic Surgery (2019) 42:531–548
https://doi.org/10.1007/s00238-019-01571-5

MASTER CLASS IN PLASTIC SURGERY

Regulatory, ethical, and technical considerations on regenerative technologies and adipose-derived mesenchymal stem cells

Michele L. Zocchi[1,2] · Vincenzo Vindigni[2] · Andrea Pagani[2] · Ortensia Pirro[2] · Giamaica Conti[3] · Andrea Sbarbati[3] · Franco Bassetto[2]

Received: 16 July 2019 / Accepted: 23 August 2019 / Published online: 11 November 2019

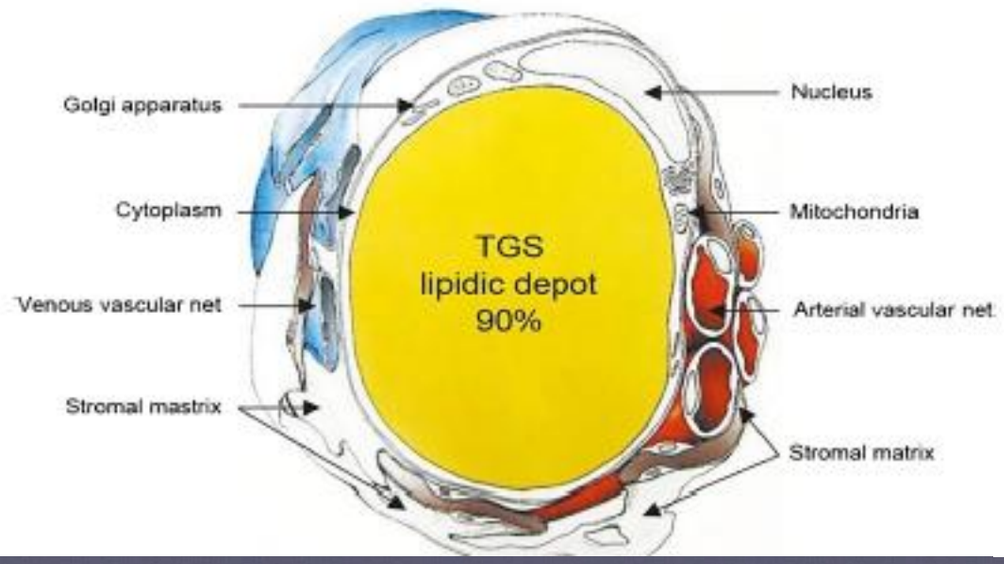


Fig. 1 a, b The most important fraction rich in MSC precursors is in the lowest layer of the syringe

CELLULE MESENCHIMALI DENOMINATE PERICITI SONO LOCALIZZATE IN CORRISPONDENZA DELLA MEMBRANA BASALE DELLA PARETE VASCOLARE E RILASCIANO FATTORI DI CRESCITA ED ALTRE MOLECOLE BIOATTIVE, DOPO UNO STIMOLO INFIAMMATORIO O MECCANICO, CONTRIBUENDO A CREARE UN MICROAMBIENTE RIGENERATIVO.

European Journal of Plastic Surgery (2019) 42:531–548
https://doi.org/10.1007/s00238-019-01571-5

MASTER CLASS IN PLASTIC SURGERY

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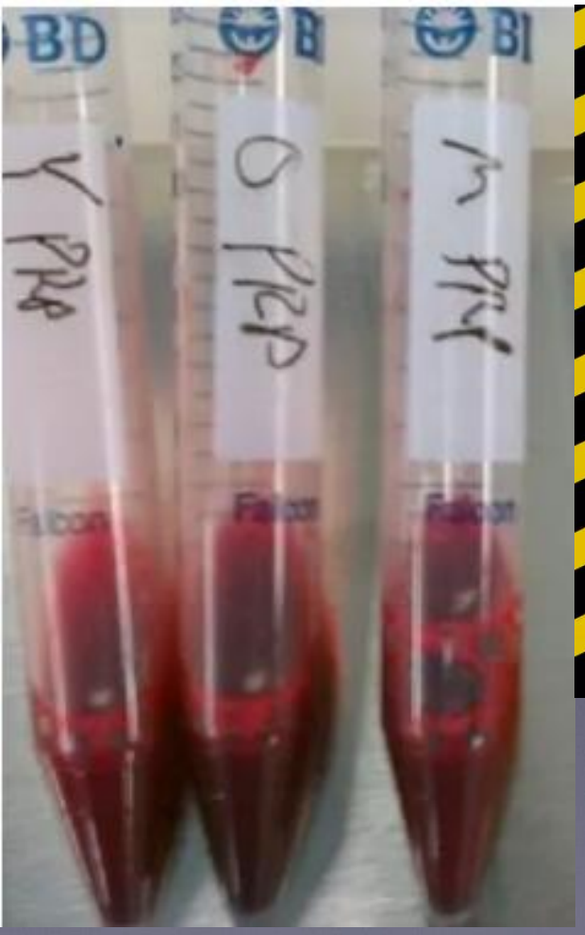

Ricco in cellule della serie bianca (granulociti e linfociti)
Il suo utilizzo favorisce una risposta infiammatoria responsabile del mancato attecchimento del tessuto adiposo

European Journal of Plastic Surgery (2019) 42:531–548
https://doi.org/10.1007/s00238-019-01571-5

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Received: 16 July 2019 / Accepted: 23 August 2019 / Published online: 11 November 2019

AMBER PRP:
Low concentration
High concentration

può contenere dal 25 al 40 % di fattori di crescita

Table 1 Growth factors are involved in key stages of wound healing and regenerative processes

Platelet-derived growth factors	
PDGF (platelet-derived growth factor)	Cell growth, regeneration and repair of blood vessels, collagen production
TGFB (transforming growth factor beta)	Growth and neogenesis of epithelial and vascular endothelial cells, promotion of wound healing
VEGF (vascular endothelial growth factor)	Growth and regeneration of vascular endothelial cells
FGF (fibroblast growth factor)	Tissue repair, cell growth, collagen production, and hyaluronic acid production
EGF (epithelial growth factor)	Promotion of epithelial cell growth, angiogenesis, promotion of wound healing

European Journal of Plastic Surgery (2019) 42:531–548
https://doi.org/10.1007/s00238-019-01571-5

MASTER CLASS IN PLASTIC SURGERY

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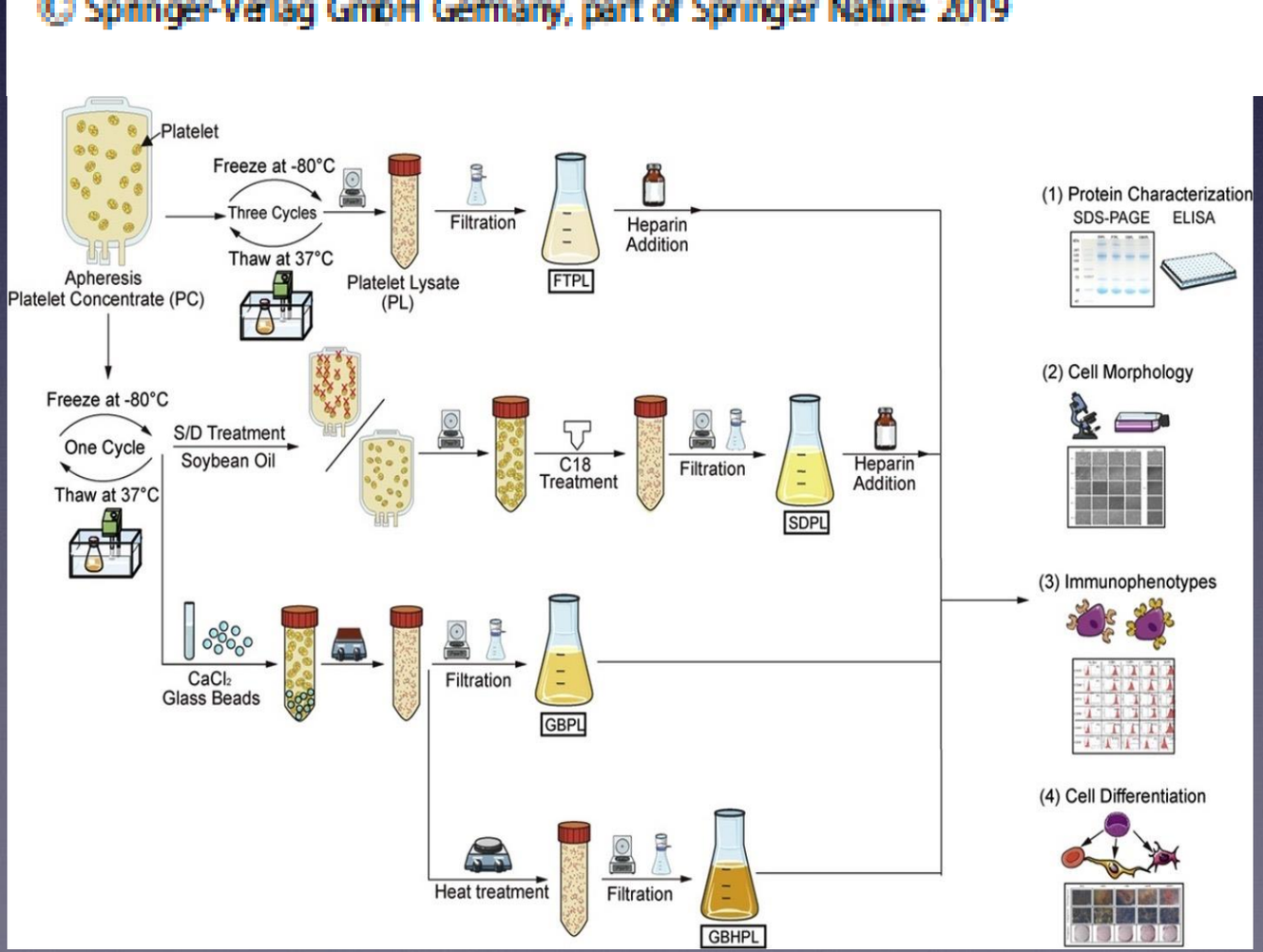
Received: 16 July 2019 / Accepted: 23 August 2019 / Published online: 11 November 2019



Lisato Piastrinico (hPL):

Ricco in fattori di crescita
Preparazione molto complessa

Lisato Piastrinico (hPL): *Preparazione*

- Unità piastrinica (normalmente 3 unità piastriniche messe insieme) viene congelata a -80 °C, poi scongelata a 37°C (3 cicli)
- Successivamente vengono sottoposte a 2 centrifughe (2600gx20min). Alla fine di questo procedimento le unità cellulari più grandi vengono eliminate. Poi il lisato viene filtrato su un filtro da 0,22 micron, per rimuovere anche gli elementi più piccoli. Poi vengono aggiunti 2 U/ml di eparina per evitare che si coaguli.

FAT GRAFT + PRP

Guarigione ferite difficili

Aesth Plast Surg (2009) 33:340–345
DOI 10.1007/s00266-008-9302-z

ORIGINAL ARTICLE

Regenerative Surgery: Use of Fat Grafting Combined with Platelet-Rich Plasma for Chronic Lower-Extremity Ulcers

V. Cervelli · P. Gentile · M. Grimaldi

Received: 19 May 2008 / Accepted: 18 November 2008 / Published online: 21 January 2009

Materials and Methods

The analysis involved 20 patients (13 women and 7 men) treated with platelet gel combined with fat tissue centrifuged in the Department of Plastic and Reconstructive Surgery at the "Tor Vergata," University of Rome. The patients ranged in age from 25 to 50 years (mean, 40 years). They were treated with Coleman technique [15–17].

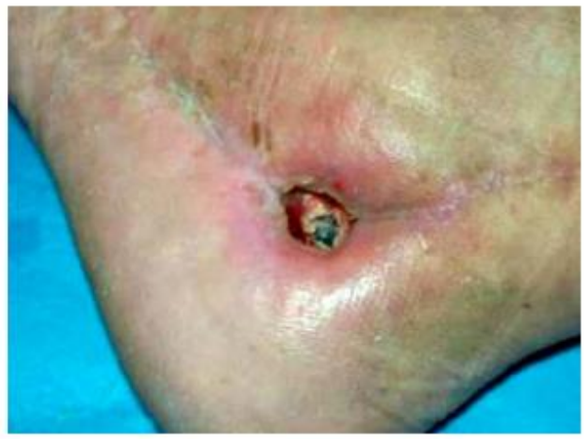


Fig. 1 Preoperative situation

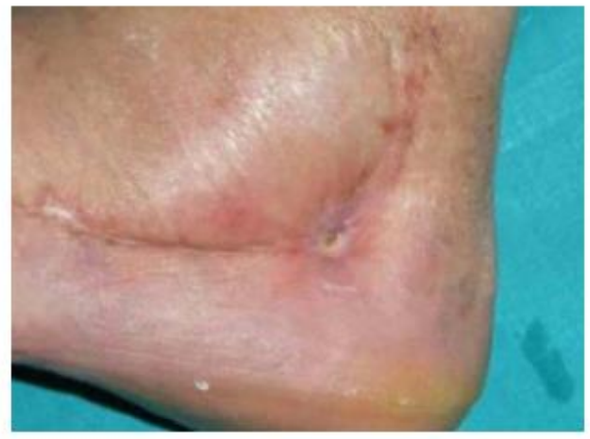


Fig. 4 Postoperative situation after 10 weeks

Table 1 Volume–quantity of platelet-rich plasma (PRP) and fat used in each case, the number of treatments, the time from the last treatment to complete healing, and any recurrences

Patient	PRP quantity (ml)	Fat quantity (ml)	No. of treatments	Time from last treatment (weeks)	Recurrences
1	10	20	2	2.5	0
2	5	10	1	6.5	0
3	10	17	1	7	0
4	9	18	1	8.5	0
5	10	23	2	3	0
6	10	25	1	9	0
7	9	21	1	7.5	0
8	10	19	1	8.5	0
9	10	18	1	8	0
10	5	17	1	7	1 after 3 months
11	9	15	1	8.5	1 after 1 year
12	10	16	2	4.5	0
13	10	18	1	6.5	0
14	9	19	1	7	1 after 7 months
15	4	8	1	6.5	0
16	7	12	2	7	0
17	10	19	2	8	0
18	50	0	1	12	0
19	10	23	1	8	1 after 1.5 years
20	30	0	1	9	0

Fat graft + PRP

Chirurgia estetica

COSMETIC

The Addition of Platelet-Rich Plasma to Facial Lipofilling: A Double-Blind, Placebo-Controlled, Randomized Trial

Joep C. N. Willemsen, M.D.
Joris Van Dongen, B.Sc.
Maroesjka Spiekman, M.Sc.
Karin M. Vermeulen, Ph.D.
Martin C. Harmsen, Ph.D.
Berend van der Lei, M.D., Ph.D.
H. P. Jeroen Stevens, M.D., Ph.D.

Groningen, The Hague, Heerenveen, and Zwolle, The Netherlands

Background: Lipofilling is a treatment modality to restore tissue volume, but it may also rejuvenate the aging skin. Platelet-rich plasma has been reported to augment the efficacy of lipofilling, both on graft take and rejuvenation, by altering the adipose-derived stem cells. The authors hypothesized that addition of platelet-rich plasma would increase the rejuvenating effect and shorten recovery time.

Methods: The study conducted was a single-center, double-blind, placebo-controlled, randomized trial (2012 to 2015). In total, a well-defined cohort of 32 healthy female patients enrolled in the study, with 25 completing the follow-up. All patients underwent aesthetic facial lipofilling with either saline or platelet-rich plasma added. Outcome was determined by changes in skin elasticity, volumetric changes of the nasolabial fold, recovery time, and patient

Fig. 2. Locations of skin measurements, marked before each measurement. Patients lay down on an examination table to enable correct Cutometer probe placement. *Location I*: 2 cm lateral and 2 cm caudal from the lateral canthus. *Locations II*: 2 cm lateral from the lateral commissure.

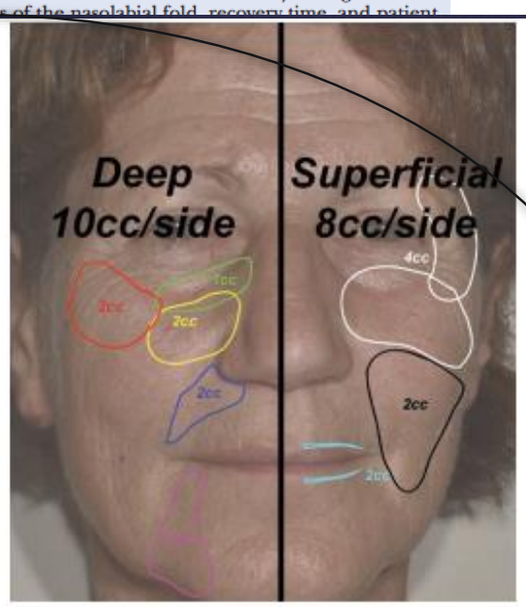
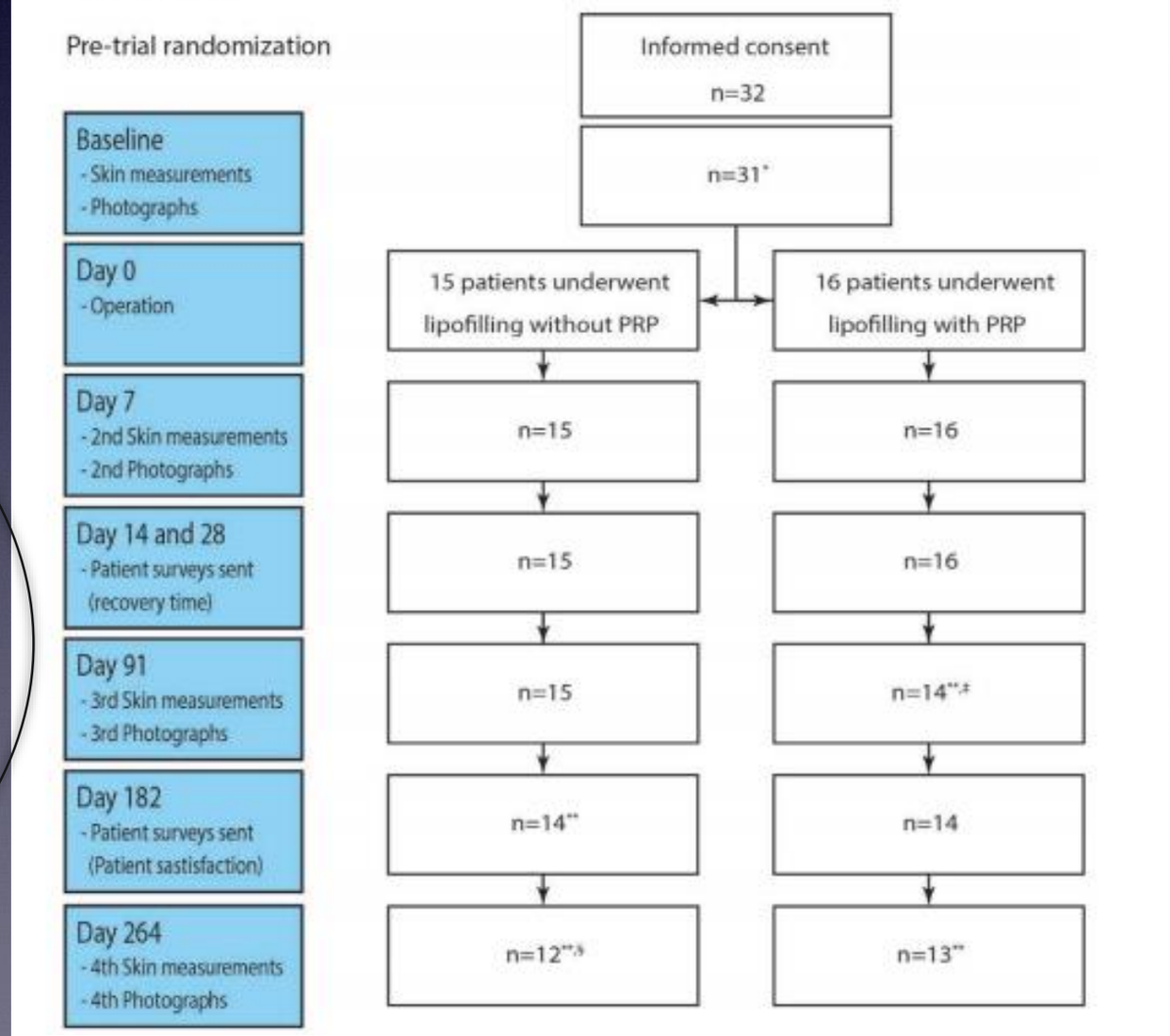


Fig. 3. Lipofilling locations and applied volume. Both superficial and deep lipofilling was performed on both sides of the face (18 cc per side; 36 cc in total). Within the platelet-rich plasma group, 3 cc of platelet-rich plasma was added to the lipofilling planes. (*Left*) Deep: temporal projection (*red*), nasojugal groove (*green*), central midface (*yellow*), nasolabial fold (*blue*), marionette line, and prejowling area and chin (*pink*). (*Right*) Superficial: temporal and central midface area (*white*), lower midface-cheek area (*black*), and white rolls (*cyan*).

Inclusion criteria:
- Female, age 35-65 years
- Stable normal BMI (20-25, 1-year stable)

Exclusion criteria:
- Smoking
- Pregnancy or active child wish
- Prior operations in the mid-face
- Active or previous use of hormone replacement therapy.
- A known systemic disease that will impair wound healing (e.g. diabetes mellitus, known atherosclerosis with an event that required hospitalization, collagen diseases, diseases of the skin)
- A known psychiatric condition
- History of cancer



Fat graft + PRP

Chirurgia estetica

Table 1. Descriptive Statistics for Both Groups*

	Group I (No PRP, $n = 12$)			Group II (PRP, $n = 13$)				Overall ($n = 25$)		
	Mean	SD	Range	Mean	SD	Range	p†	Mean	SD	Range
Age at the time of surgery, yr	52.5	7.1	42–63	51.73	6.7	38–62	NS	52.10	6.8	38–63
Platelet count at the time of surgery	234.2	47.9	153–299	250.1	37.5	168–312	NS	242.8	42.9	153–312
Recorded complications (major or minor)	0			0			—	0		

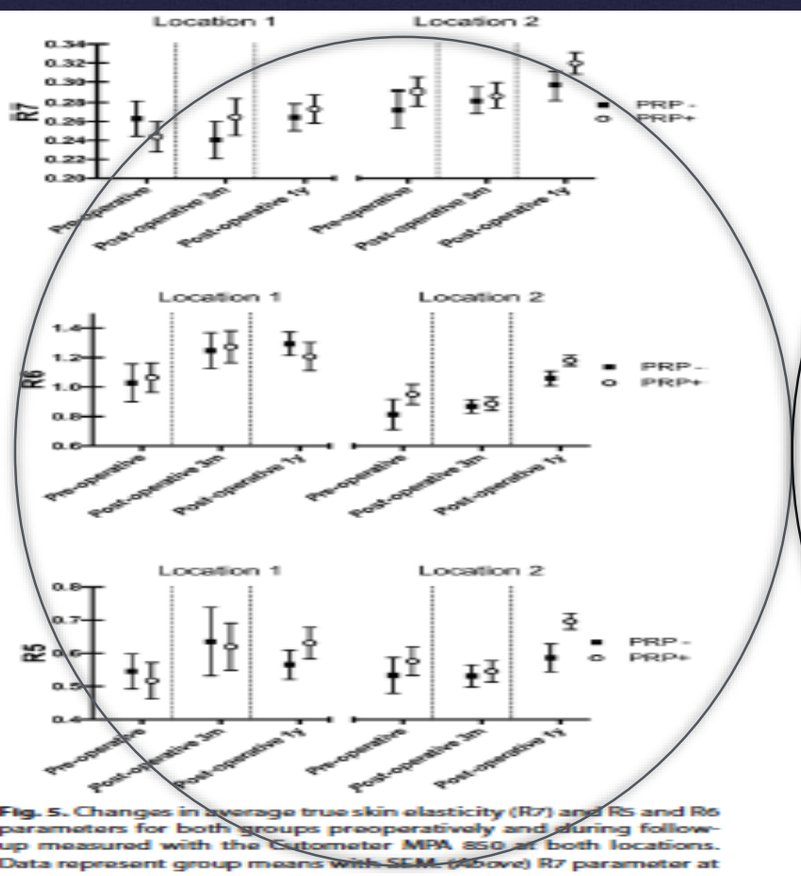


Fig. 5. Changes in average true skin elasticity (R7) and R5 and R6 parameters for both groups preoperatively and during follow-up measured with the Cutometer MPA 580 at both locations. Data represent group means with SEM. (Above) R7 parameter at

Elasticità cutanea

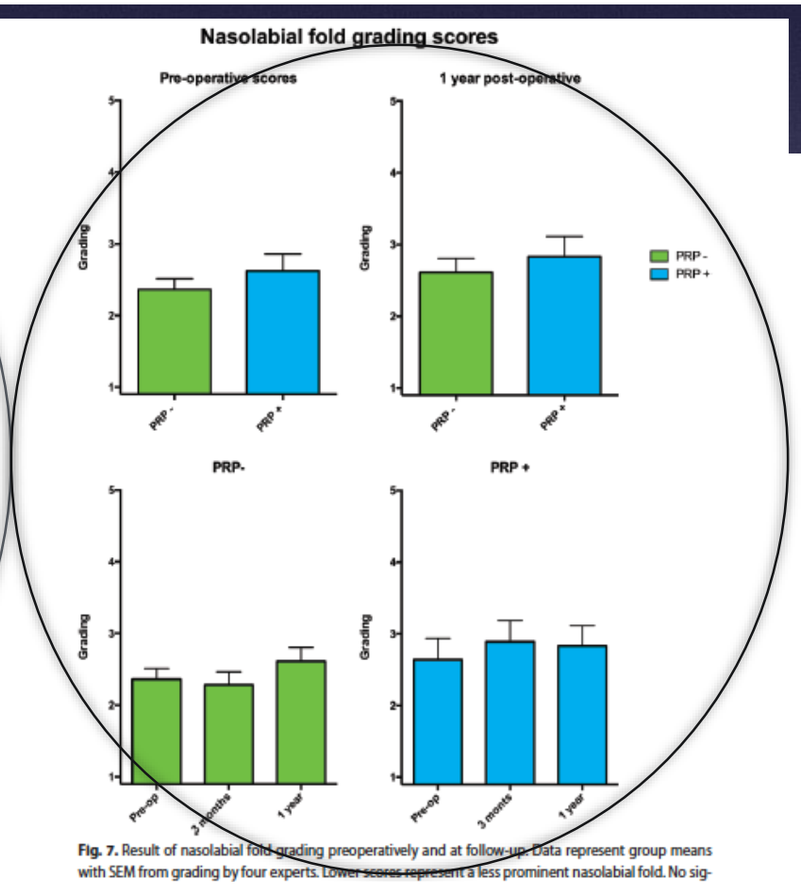


Fig. 7. Result of nasolabial fold grading preoperatively and at follow-up. Data represent group means with SEM from grading by four experts. Lower scores represent a less prominent nasolabial fold. No sig-

Solco nasolabiale

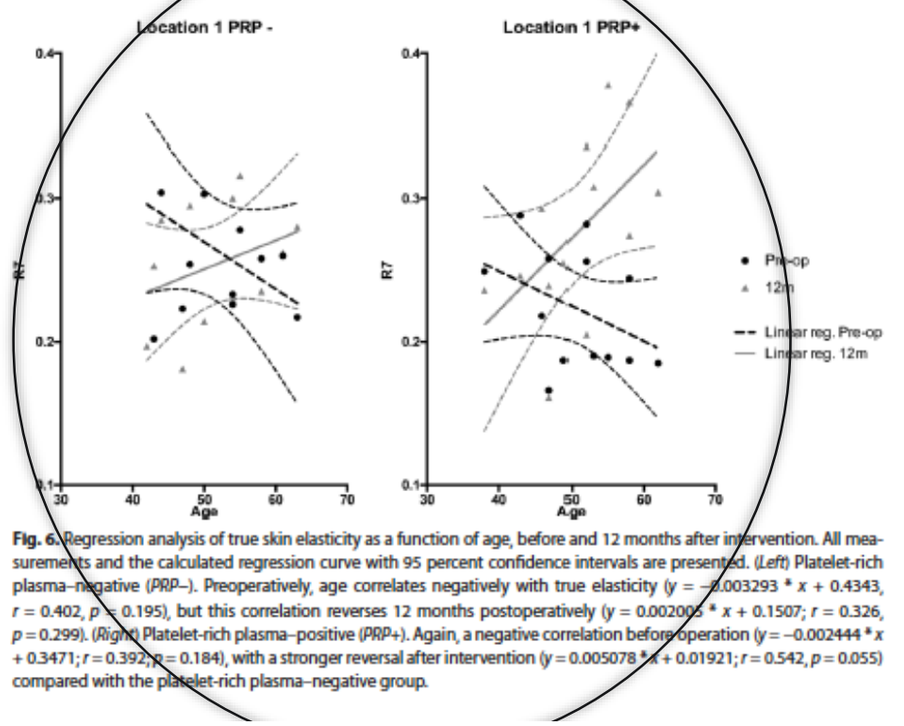


Fig. 6. Regression analysis of true skin elasticity as a function of age, before and 12 months after intervention. All measurements and the calculated regression curve with 95 percent confidence intervals are presented. (*Left*) Platelet-rich plasma–negative (*PRP–*). Preoperatively, age correlates negatively with true elasticity ($y = -0.003293 * x + 0.4343$, $r = 0.402$, $p = 0.195$), but this correlation reverses 12 months postoperatively ($y = 0.002005 * x + 0.1507$; $r = 0.326$, $p = 0.299$). (*Right*) Platelet-rich plasma–positive (*PRP+*). Again, a negative correlation before operation ($y = -0.002444 * x + 0.3471$; $r = 0.392$; $p = 0.184$), with a stronger reversal after intervention ($y = 0.005078 * x + 0.01921$; $r = 0.542$, $p = 0.055$) compared with the platelet-rich plasma–negative group.

Relazione tra età ed elasticità cutanea

Fat graft + PRP

Chirurgia estetica

COSMETIC

The Addition of Platelet-Rich Plasma to Facial Lipofilling: A Double-Blind, Placebo-Controlled, Randomized Trial

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Karin M. Vermeulen, Ph.D.
Martin C. Harmsen, Ph.D.
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Groningen, The Hague, Heerenveen, and Zwolle, The Netherlands

Background: Lipofilling is a treatment modality to restore tissue volume, but it may also rejuvenate the aging skin. Platelet-rich plasma has been reported to augment the efficacy of lipofilling, both on graft take and rejuvenation, by altering the adipose-derived stem cells. The authors hypothesized that addition of platelet-rich plasma would increase the rejuvenating effect and shorten recovery time.

Methods: The study conducted was a single-center, double-blind, placebo-controlled, randomized trial (2012 to 2015). In total, a well-defined cohort of 32 healthy female patients enrolled in the study, with 25 completing the follow-up. All patients underwent aesthetic facial lipofilling with either saline or platelet-rich plasma added. Outcome was determined by changes in skin elasticity, volumetric changes of the nasolabial fold, recovery time, and patient

This randomized, double-blind, placebo-controlled study clearly has shown that platelet-rich plasma significantly reduces postoperative recovery time but does not improve patient outcome when looking at skin elasticity, improvement of the nasolabial fold, or patient satisfaction. The reversal of the correlation between age and elasticity might indicate some effect on skin but requires more power in future studies. Thus far, the use of platelet-rich plasma as an additive in lipofilling has shown great promise in vitro. These beneficial effects, however, have only partially been reproduced in a clinical setting. A growing number of studies report a concentration-dependent effect of platelet-rich plasma in vitro, making optimal use in a clinical setting delicate and complex. Further studies of platelet-rich plasma interactions on both the lipograft and the receptor host site–involved cells seem to be of paramount importance to determine the optimal use and concentrations of platelet-rich plasma in a clinical setting.

Fat graft + PRP

Chirurgia estetica

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Does non-activated platelet-rich plasma (PRP) enhance fat graft outcome? An assessment with 3D CT-scan in mice

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6 ratti sono stati sottoposti a micro CT scan dopo 1 -7-14-30 giorni
3 ratti sono stati sottoposti a micro Ct scan dopo 90 giorni

Nello studio è stato eseguito un lipofilling nello scalpo di due gruppi di ratti.

Il primo gruppo ha ricevuto lipofilling + 20% di Prp non attivato

Nel gruppo controllo il tessuto adiposo è stato addizionato ad un 20% di soluzione

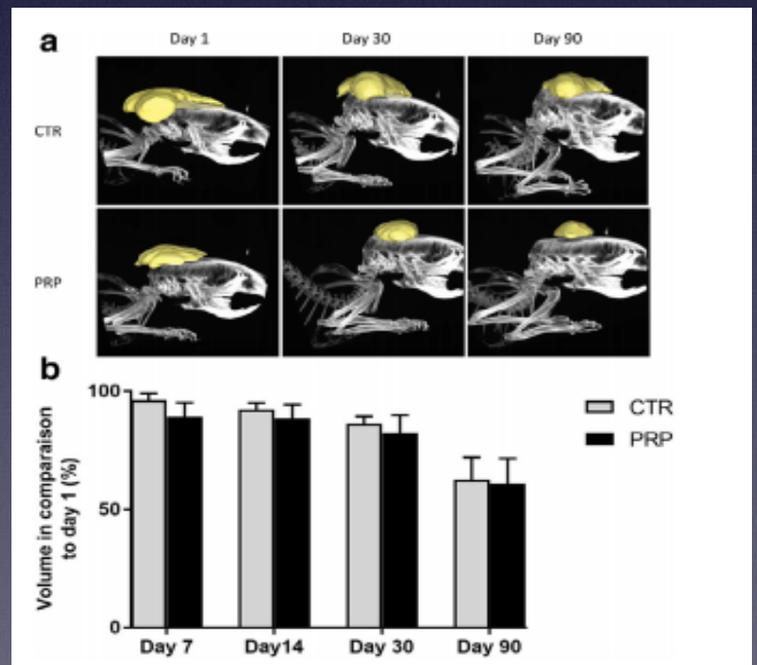

Figure 2 The CT-scan analysis of fat graft volume. (a) 3D images of CT-scan on the scalp on the 1, 30 and 90 after fat grafting with our without PRP. (b) Quantification of 3D fat graft volume does not show any significant difference between CTR group and non-activated-PRP group. Results are quantified as a % of volume present on day 7, 14, 30 and 90 compared to day 1. CTR: fat + 20% saline, PRP: fat + 20% non-activated-PRP ($n = 6$ for day 7, 14 and 30; $n = 3$ for day 90).

Fat graft + PRP

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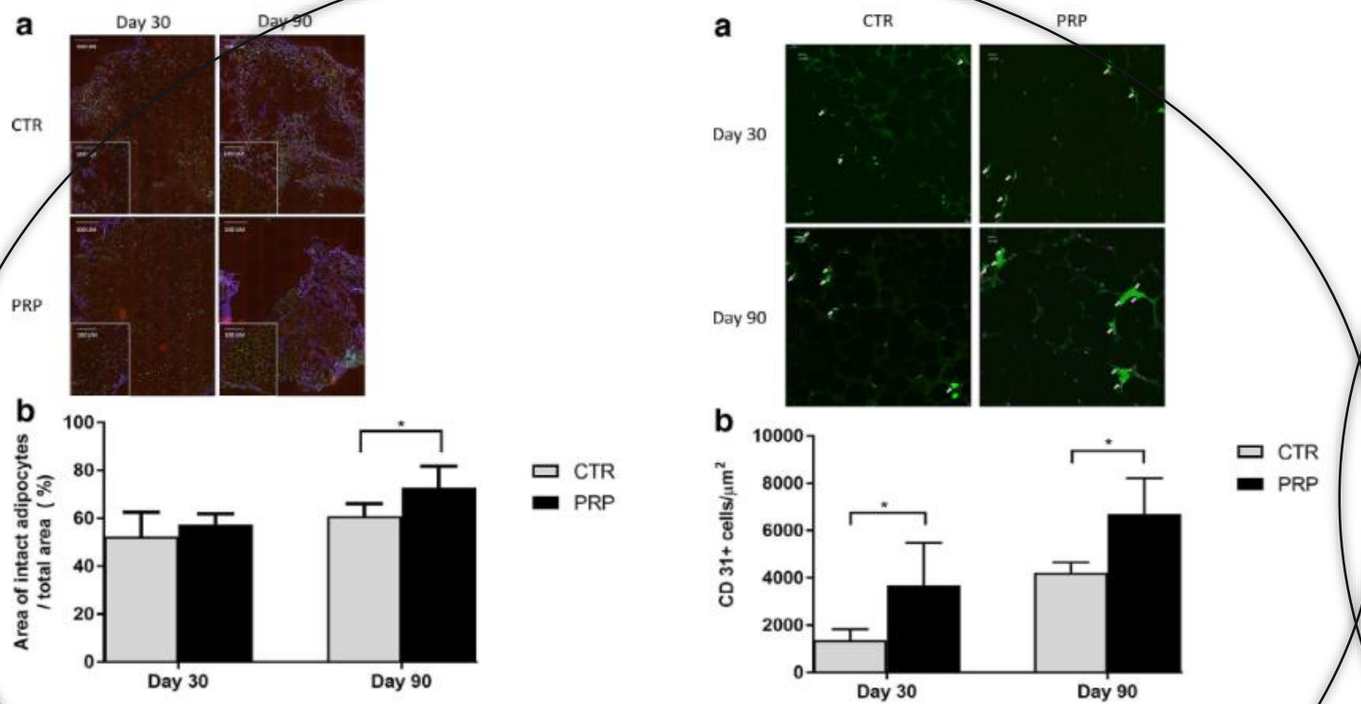

Figure 3 Immunohistochemistry analysis for intact adipocytes: (a) cells marked with anti-perilipin in green and Hoechst in blue on day 30 and day 90 for CTR and PRP (500 μm and 100 μm magnification). (b) quantification of the portion of the surface occupied by intact cells to the total surface. The gray bars represent CTR group and the black bars represent PRP group. ($n = 3$) (*$p < 0.05$).

by intact adipocytes (72.66%) compared to the control group (60.78%; $p < 0.05$) (Figure 3(b)).

Figure 4 Imunohistochemistry analysis for neoangiogensis: (a) endothelial cells marked with anti-human CD31 (green, highlighted with arrow) in the grafted fat on day 30 and day 90, for CTR and PRP groups on the scalp in 50 μm magnification. (b) Quantification of the portion of the surface occupied by CD31-positive cells (pixels quantification) to the total surface. The gray bars represent CTR group and the black bars represent PRP group. ($n = 3$) (*$p < 0.05$).

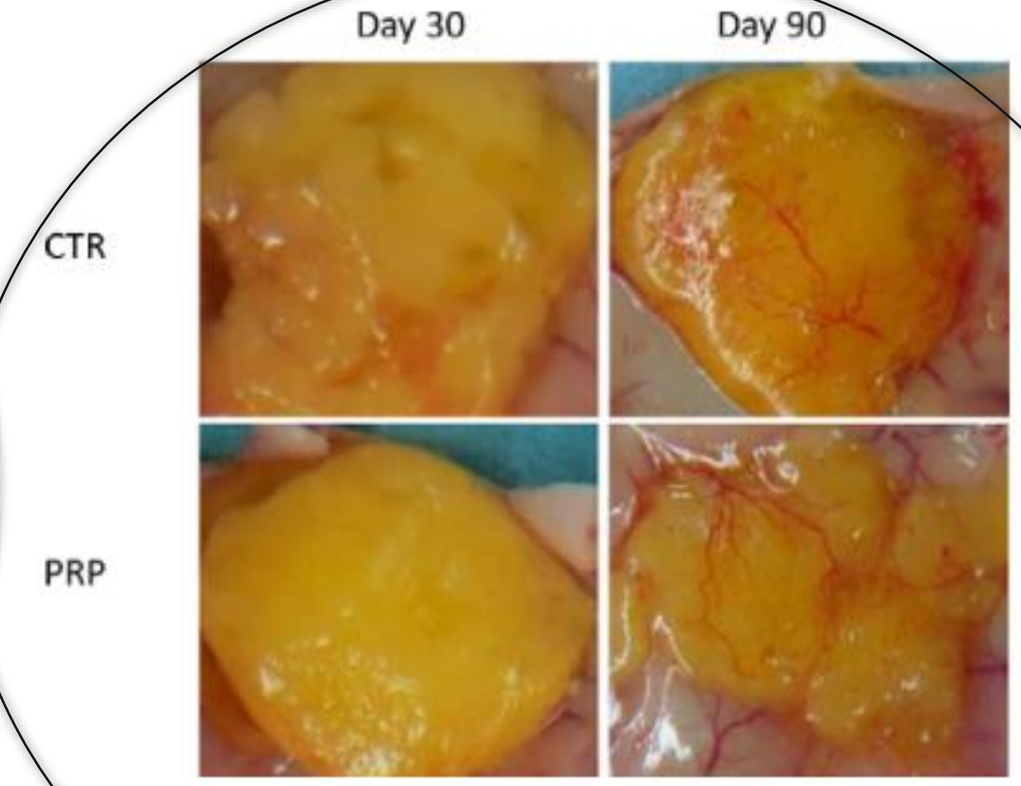

Figure 1 Macroscopic representative view of grafted fat on the scalp of mice on day 30 and 90 after grafting, showing more vascularization with 20% PRP. CTR: fat + 20% saline, PRP: fat + 20% non-activated-PRP.

Discussion

Our findings show that the adjunction of nPRP to fat grafts does not increase their residual volume when measured by CT-scan at day 90, despite a significant increase of adipocyte viability and tissue vascularity.

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Rejuvenation Using Platelet-rich Plasma and Lipofilling for Vaginal Atrophy and Lichen Sclerosus

Seok Hwan Kim, Eun Soo Park, and Tae Hee Kim

Fat graft + PRP

Atrofia vulvo vaginale

MIGLIORAMENTO DEL QUADRO LOCALE DI LICHEN SCLEROSUS E DEI SEGNI E SINTOMI DELL'ATROFIA VULVOVAGINALE

A total of 36 cc of autologous fat was harvested from the abdomen using a 10 cc Luer-Lok syringe and two-hole cannula with a blunt tip. A total of 4 cc of autologous PRP was prepared using SmartPreP® APC-30 kit from 30 cc of whole blood. A total 40 cc of autologous fat mixed with PRP was transferred into 1 cc syringes and injected into the subcutaneous layer of the labia majora aseptically via four ports (Fig. 3).

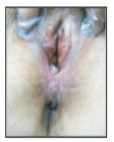

Fig. 5
Photographic finding 1 year post-operatively. Note that resolution of white patchy lesions on labia minora examined by a gynecologist colleague.

A vulvar biopsy is recommended when malignancy cannot be excluded or in those who have failed to respond to first-line treatment. But the diagnosis of lichen sclerosus is usually clinical. The goal of treatment is to reduce symptoms such as pruritus and dryness, improve the patient's quality of life, and to detect any malignant transformation. Lichen sclerosus is generally steroid-responsive, the treatment of choice in adults and children and in both sexes is an ultrapotent topical steroid. In this case, lichen sclerosus was steroid-resistant so that the resolution could be achieved after transfer of autologous fat mixed with PRP. As mentioned earlier, ADSCs-containing lipograft has the regenerative properties and capabilities to produce anti-inflammatory and immunomodulatory effect. Besides the presence of ADSCs in the lipograft, PRP seemed to be an essential factor influencing the healing and regeneration process in this case. PRP has shown to enhance wound healing and has rejuvenation effects through the release of significant amounts of growth factors.

There are several limitations to this study. These benefits are limited to this single case. Histologic evaluation and an immunoassay were not carried out. So, the exact mechanisms of autologous lipofilling with PRP were not clearly demonstrated. Use of the technique in more women and further studies to establish their reliable efficacy are needed before the technique can become a reliable option in the management of the vaginal atrophy and lichen sclerosus.

Application of autologous lipofilling mixed with PRP in this case produced the relief of symptoms, contour

CRITICITA’

Grado di raccomandazione delle indicazioni cliniche (Consensus Conference American College of Chest Physician 2004)

- SAFETY & EFFICACY : tendenza alla pubblicazioni dei dati solo nel caso in cui il PRP funziona, omettendo i dati sui fallimenti terapeutici. Inoltre non sempre la numerosa rappresentazione campionaria corrisponde ad una effettiva attestazione di efficacia; anche l’arruolamento di pochi pazienti può fornire indicazioni utili alla reale efficacia del PRP

- SCARSA COMPARABILITA’ DATI E DEBOLEZZA STATISTICA
- DATI SUL TIMING SOMMINISTRAZIONE
- OUTCOME CLINICI
- ALTO GRADO DI RISK BIAS