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Useful PRP

on face, hand and scalp

What is PRP?

Why is PRP?



History of Platelet-Rich Plasma

- ✓ **Hematologists** created the term PRP in the 1970's
 - : initially used as a transfusion product to treat thrombocytopenia
- ✓ Ten years later : used in **maxillofacial surgery** as anti-inflammatory characteristics stimulated cell proliferation
- ✓ The musculoskeletal field in **sports injuries** : extensively used
 - Tiger Woods** and tennis star **Rafael Nadal** : use to help heal injuries
- ✓ **Cardiac** surgery, **pediatric** surgery, **gynecology**, **urology**, **plastic surgery**, and **ophthalmology**

History of Platelet-Rich Plasma

More recently : tissue regeneration, wound healing, scar revision
skin rejuvenation, and alopecia

In cosmetic dermatology : stimulate human dermal **fibroblast proliferation** and increase **type I collagen** synthesis

Another application of PRP : burn scars, postsurgical scars, and **acne scars, promoting hair growth**

However, The U.S. Food and Drug Administration : **not definitively proven**

What is PRP?

Platelet-**r**ich **p**lasma (PRP) : a substance that promote healing

Plasma : contains special “factors,” or proteins that support cell growth

Platelets : the clotting cells of blood that growth factors released
recruit reparative cells
augment tissue repair and accelerate soft tissue healing

What is PRP?

PRP : **300~700%** enrichment, greater than **1,000,000** platelets/ μ l

Various growth factors - platelet-derived growth factor (**PDGF**)

transforming growth factor (**TGF**)

vascular endothelial growth factor (**VEGF**)

insulin-like growth factor (**IGF**)

What is PRP?

Various growth factors : secreted from the **α -granules** of concentrated platelets activated by aggregation inducers

Regulation processes - cell **migration, attachment, proliferation**
differentiation

- ECM **accumulation** by binding to specific
cell surface receptors

What is PRP?

CHART 1: Growth factors in platelets

GROWTH FACTOR	BIOLOGICAL ACTIVITY
TGF (Transforming Growth Factor) α e β	Proliferation and differentiation control of many cell types
PDGF (Platelet derived growth factor) α, β, C, D	Potent mitogen for connective tissue cells, inhibitor of apoptosis, increases the motility of mesenchymal cells, fibroblasts, endothelial cells, and neurons. May be involved in physiological processes and in diseases such as cancer and atherosclerosis
IGF I (Insulin-like growth factor I)	Promotes the mediation of the various effects of growth hormone
FGF I (Fibroblast growth factor I)	Induction of fibroblast proliferation and angiogenesis
EGF (Epidermal growth factor)	Induces the differentiation of cells and mitosis of cells of ecto and mesodermal origin
VEGF A, B e C (Vascular Endothelial growth factor)	Induces angiogenesis through the induction of mitosis in endothelial cells, and promotes alterations in vascular physiology and permeability

What are the purposes of PRP injections?

Hair loss: promote hair growth and prevent hair loss (androgenic alopecia)

Tendon injuries: treat chronic tendon problems (tennis elbow, Achilles tendonitis)

Acute injuries: treat acute sports injuries (pulled hamstring muscles or knee sprains)

Postsurgical repair: repair a torn tendon (rotator cuff tendon ACL)

Osteoarthritis: more effective than hyaluronic acid injections

Skin rejuvenation: Wrinkle on face, hand

PRP injection process

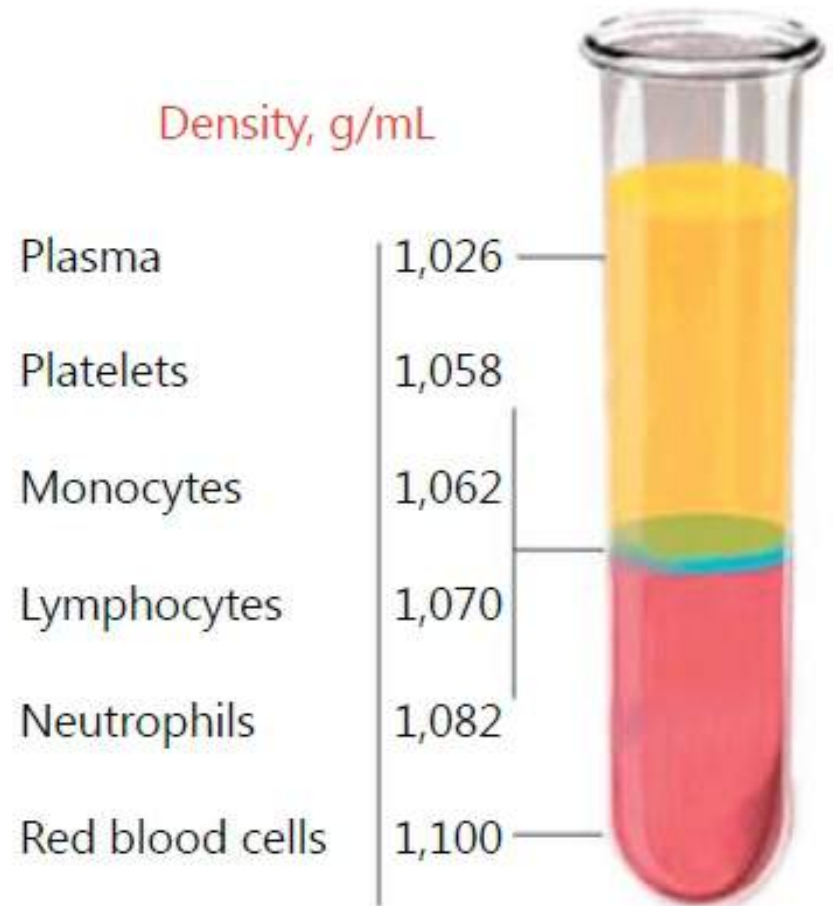
PRP injection process :

draw a sample of blood 10cc-20cc

placed into a centrifuge

-> (separation takes about **15 min** in **3000 RPM**)

inject the PRP into **the affected area**



What are the potential **side effects** of PRP?

PRP : injecting a substance into **the skin**

- Risks from the injection **itself**, including:

infection

nerve injuries

pain at the injection site

tissue damage

ARE THERE RISKS WITH PRP?

safe treatment option with no risk of allergic reaction (own blood)

Needle : a risk of infection, bleeding, and nerve damage

In general, PRP : not a first line treatment

other more traditional treatments have failed

Clinical application of **PRP**
as an **facial rejuvenation**

Facial rejuvenation

Wrinkled, sagging skin : not the inevitable result of getting older

Marks of the aged skin : dryness, UV dyschromia, wrinkles, and sagging skin

Histologically : a flattened dermal-epidermal junction, dermal atrophy, photo-damaged skin unorganized collagen fibrils and undergoes elastic degeneration

Facial rejuvenation

The **primary goals** of medical aesthetics : minimize the facial volume loss and reduce the appearance of wrinkles

Wrinkle formation : the degeneration of the collagen fibers and deposition of the elastic content of the skin, damage to the dermal extracellular matrix due to the impairment of the structural integrity, reduced skin resilience

Facial rejuvenation

A number of methods for skin rejuvenation

- laser, light and other energy-based treatments, chemical peeling, and other non-ablative methods

PRP : stimulate collagen synthesis and epidermal thickening

improves the skin tone, minimizes the wrinkles, and repairs other signs of facial aging to activate and stimulate cell proliferation and collagen synthesis, minimize the wrinkles, and improve the overall skin appearance

Facial rejuvenation

Fine wrinkle : laser, chemical peeling, tretinoin

Thick wrinkle : filler collagen, HA, fat graft, PRP, fibroblast therapy
face lift operation or rhytidectomy

expression wrinkle : Clostridium botulinum toxin

Sunken wrinkle : fat graft, facelift operation, rhytidectomy

Can Platelet-rich Plasma Be Used for Skin Rejuvenation? Evaluation of Effects of Platelet-rich Plasma on Human Dermal Fibroblast

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Background: Autologous platelet-rich plasma has attracted attention in various medical fields recently, including orthopedic, plastic, and dental surgeries and dermatology for its wound healing ability. Further, it has been used clinically in mesotherapy for skin rejuvenation. **Objective:** In this study, the effects of activated platelet-rich plasma (aPRP) and activated platelet-poor plasma (aPPP) have been investigated on the remodelling of the extracellular matrix, a process which requires activation of dermal fibroblasts, which is essential for rejuvenation of aged skin. **Methods:** Platelet-rich plasma (PRP) and platelet-poor plasma (PPP) were prepared using a double-spin method and then activated with thrombin and calcium chloride. The proliferative effects of aPRP and aPPP were measured by [³H]thymidine incorporation assay, and their effects on matrix protein synthesis were assessed by quantifying levels of procollagen type I and type III. Procollagen type I peptide (PIP) by enzyme-linked immunosorbent assay (ELISA) is an autologous preparation of platelet-rich plasma. Although the optimal

PIP were highest in cells grown in the presence of 5% aPRP. Additionally, aPRP and aPPP increased the expression of type I collagen, MMP-1 protein, and mRNA in human dermal fibroblasts. **Conclusion:** aPRP and aPPP promote tissue remodelling in aged skin and may be used as adjuvant treatment to lasers for skin rejuvenation in cosmetic dermatology. (Ann Dermatol 23(4) 424~431, 2011)

INTRODUCTION

is an autologous preparation of platelet-rich plasma. Although the optimal

Facial rejuvenation



Clinical application of **PRP**

as an **Hand wrinkles**

Clinical application of PRP as an Hand wrinkles

Intrinsic aging : gradual biological and functional decline of cells

Extrinsic aging : influence as smoking, exposure to chemicals or UV radiation

UV radiation : diminishes the structural function and integrity of the ECM through collagen degeneration and abnormal elastin structure, leading to the loss of both skin tone and elasticity, causing the signs of aging

Clinical application of PRP as an Hand wrinkles

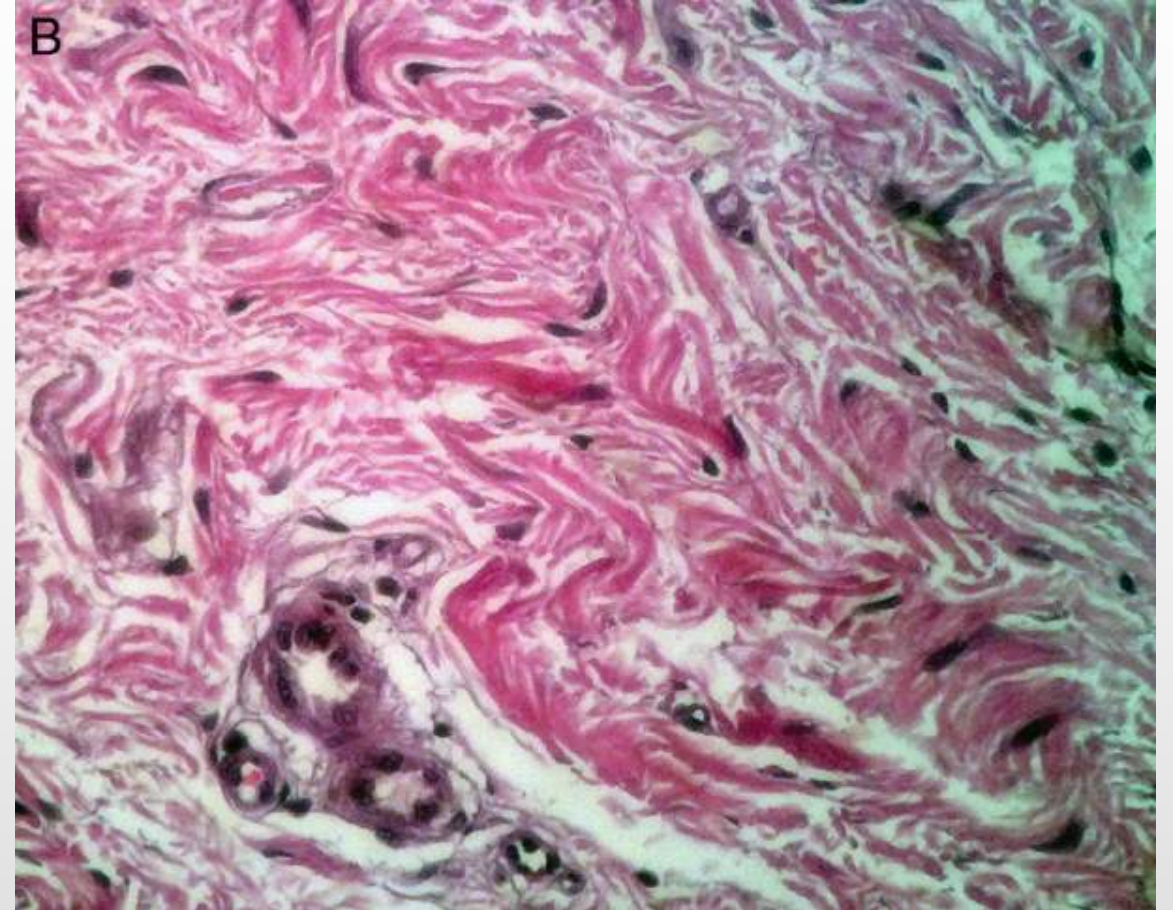
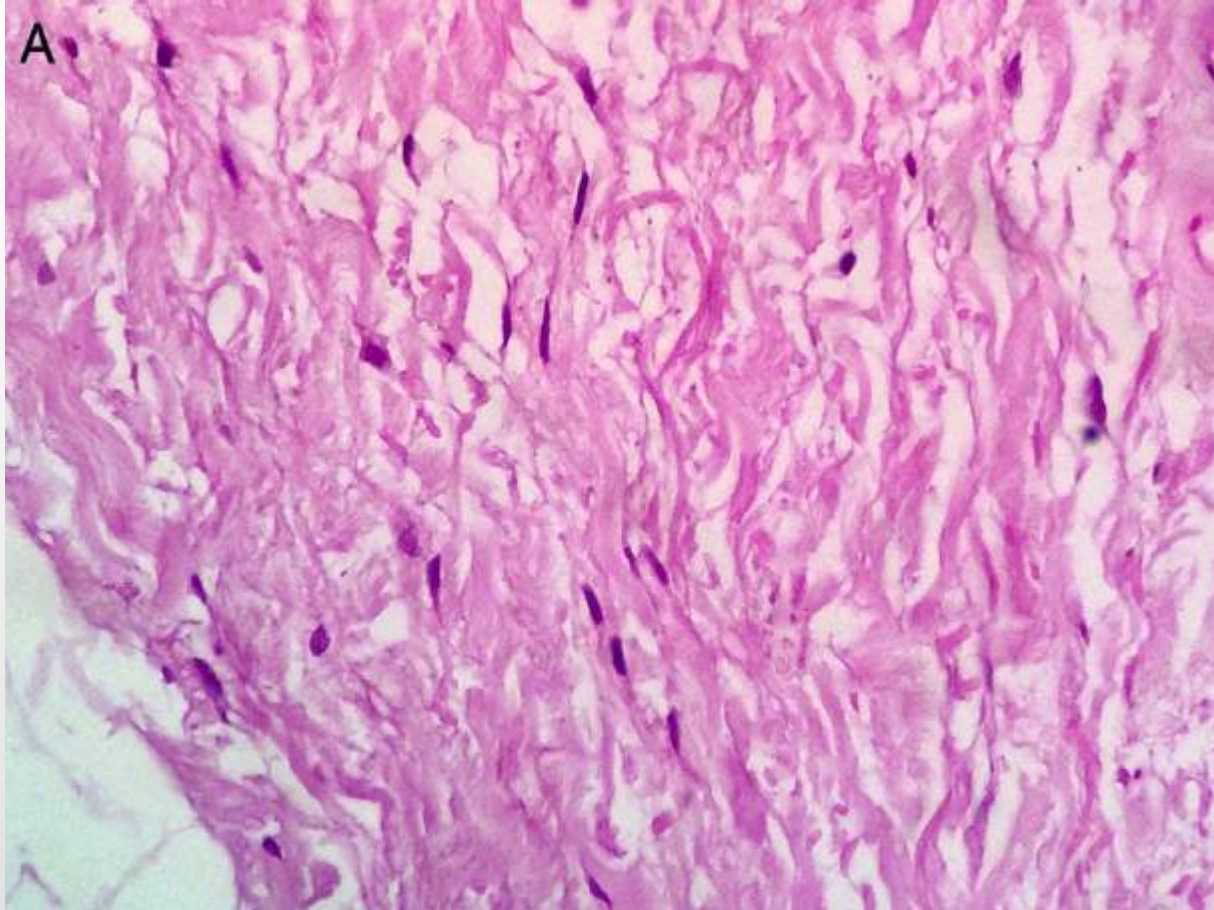
Histologic assessment

- increases in the number of blood vessels and fibroblasts per number of nuclei examined
- Papillary dermal collagen had also increased

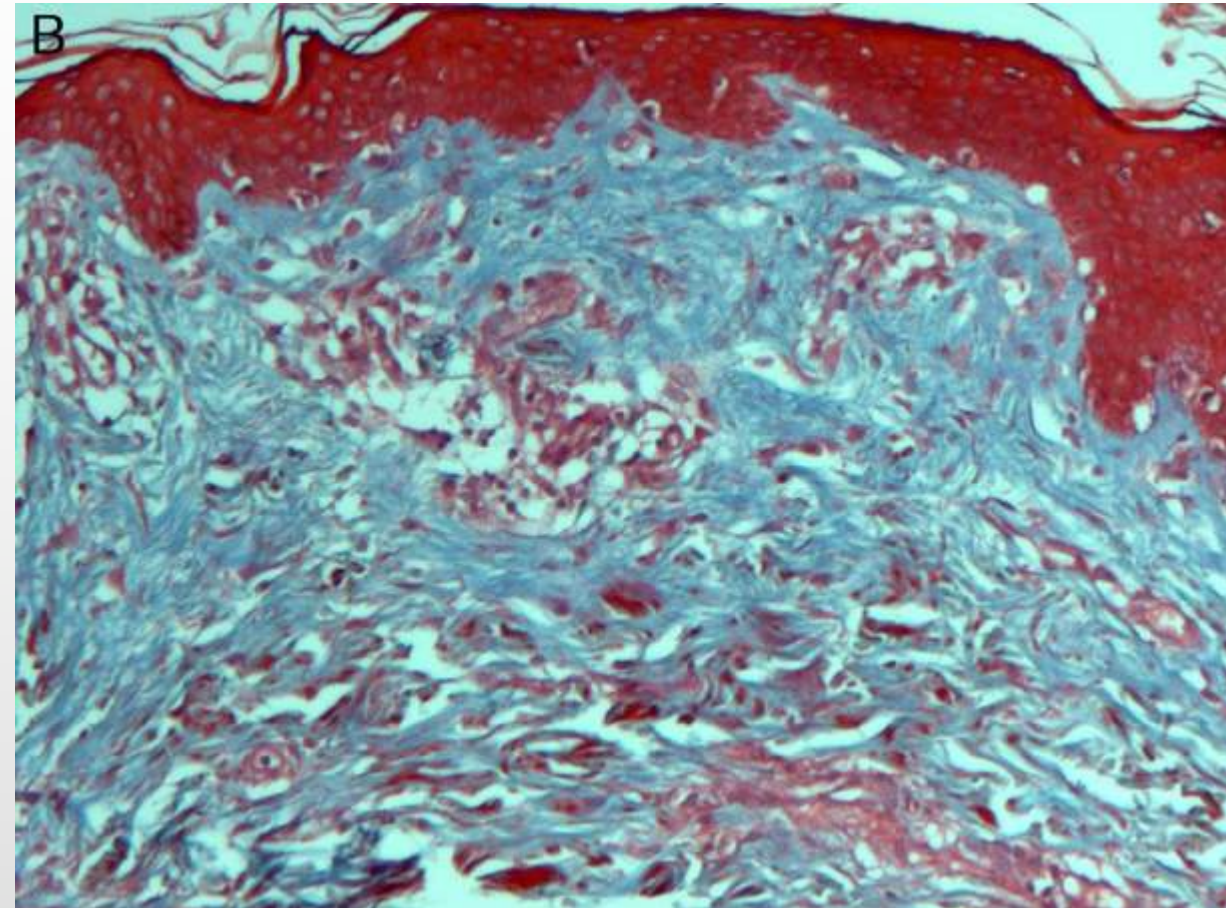
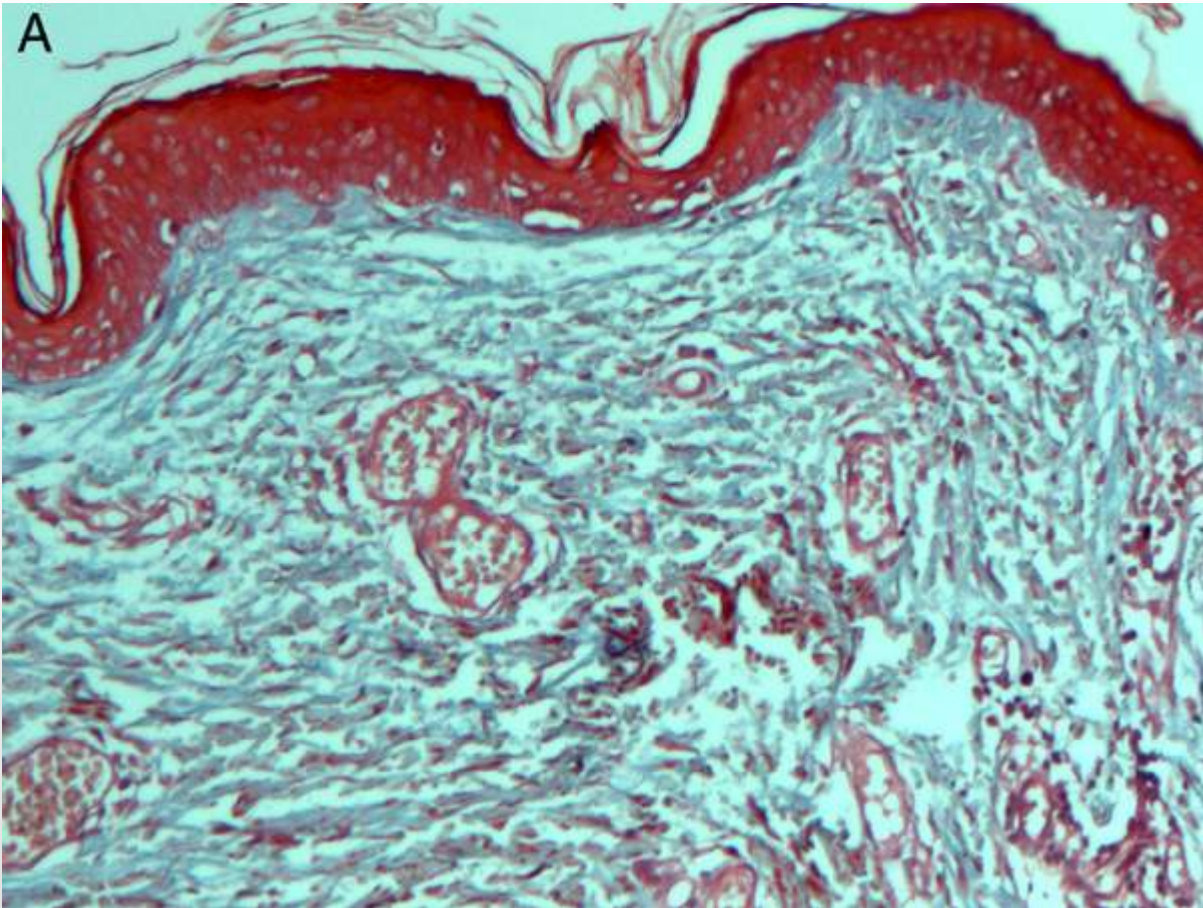
Anesthetic Technique PRP Application



Anesthetic Technique PRP Application



Anesthetic Technique PRP Application



Platelet-Rich Plasma for the Treatment of Photodamage of the Skin of the Hands[☆]



Damage of

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Platelet-Rich Plasma for the Treatment of Photodamage of the Skin of the Hands

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KEYWORDS

Photodamage
Platelet-rich p
Growth factor

Conclusions: PRP induced a reduction in the manifestations of skin aging, including an improvement in wrinkles and elastosis.

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Material and methods: Experimental study enrolling persons with photodamaged skin on the dorsum of the hands (Glogau photoaging scale, type III, or Fitzpatrick wrinkle classification, type II) were included between August 2012 and January 2013. A histological comparison was made of skin biopsies taken before and after the application of PRP to the skin of the dorsum of the hands.

Results: The mean (SD) age of the 18 women enrolled was 47.9 (4.3) years. Histological analysis showed an increase in the number of fibroblasts ($P<.001$), number of vessels ($P<.001$), and collagen density ($P=.27$). These changes produced significant improvements in the Fitzpatrick wrinkle and elastosis scale ($P<.001$) and in the Glogau photoaging scale ($P=.01$).

Clinical application of **PRP**

as an **Hair loss and scalp**

Clinical application of **PRP** as an **Hair loss** and scalp

Normal hair loss : less than **100 hairs** fall each day

Medical treatments : **minoxidil** lotion, **finasteride** 1 mg oral
cyproterone acetate oral

New preventing hair-loss and baldness : stimulated by cellular therapy
with traumatising and then infusing PRP

Clinical application of **PRP** as an **Hair loss** **and scalp**

In men : begins at the temples and at the vertex of the scalp

In women : diffuse thinning without hairline recession

PRP : helps patients with early *AGA by stimulating the proliferation and differentiation of stem cells in the hair follicle

*AGA : androgenic alopecia

Clinical application of PRP as an Hair loss and scalp

PDGFs : involved in both epidermis–follicle interaction and hair canal formation

VEGF : as a significant mediator of hair follicle growth and cycling that improved follicle vascularisation promotes hair growth, as well as increasing follicle and hair size

EGF : control the orientation and elongation of follicles
the proliferation of basal keratinocytes

Clinical application of PRP as an Hair loss and scalp

Derma-stamp micro-needling

- enhance the topical absorption of PRP in the scalp
- creates thousands of microchannels in the epidermis to stimulate growth and healing.

Tx option :

**PRP injections + microneedling + adding medications
+ LED laser treatments**

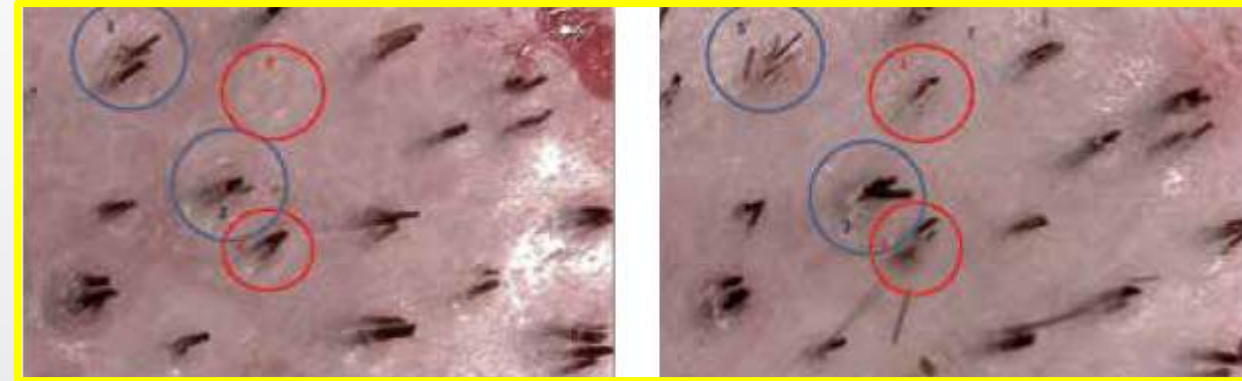
Clinical application of PRP as an Hair loss and scalp

In hair surgery and transplantation

- PRP can improve the donor area and increase graft survival

PRP could be an alternative treatment for AGA

Clinical application of PRP as an Hair loss and scalp



Clinical application of PRP as an Hair loss and scalp



PRP in Hair Restoration

PRP : non-surgical therapeutic option for patients who require stimulation of hair growth for hair loss conditions

Thank you
for your attention!