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## Effects of autologous conditioned serum (ACS) injection on morphology and gene expression in human 3D skin models

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In recent years dermatological research has increasingly applied 3D skin equivalents, as studies in human skin are subject to strict conditions for ethical reasons and the skin of many laboratory animals does not correspond in their biological and structural properties to the situation in human skin. In this study, we established a standardized human in vitro 3D skin model for the investigation of the biological effects of intradermal injections.

In this new skin model, we first investigated the effect of pooled autologous conditioned serum (ACS) on the morphology of the epidermis and dermis, the gene expression profile, as well as the epidermal proliferation. For these investigations, skin models were injected intradermally on day 0 with pooled autologous conditioned serum or cell culture medium as control. The models were then further cultured for 3, 5 or 14 days and the effects of the injection treatment on the morphology of the skin was then examined by histological examination. In these studies, KI67

staining revealed an increase in keratinocyte proliferation compared to placebo treatment at all-time points of investigation, in particular 14 days after ACS injection. Microarray- and qRT-PCR analysis identified upregulation of genes associated with regulation of cell cycle progression and differentiation (S100A2), synthesis of unbranched hyaluronic acid (HAS3), cell growth and tissue repair (FGF17), chemotactic recruitment of leukocytes and angiogenesis (CXCL8) and mediation of epithelial wound healing (Serpine1). Gene ontology (GO) analysis of microarray results (day 3 and day 5) revealed significant effects on skin development and keratinocyte differentiation at both time points. In summary, these novel in vitro models allow a better understanding of the biological effects of ACS in human skin and enable comparison to the mechanisms of action of other aesthetic treatment methods.

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# Poster abstracts

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## Biological effects of hyaluronic acid based dermal fillers and fractional ablative laser therapy on human 3D skin models

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### Introduction/Background

Hyaluronic acid (HA) fillers are commonly used due to their hygroscopic property, biocompatibility and reversibility. So far, the direct biological effects of dermal fillers monotherapy and combination therapy with ablative fractional laser irradiation on human skin cells are not completely understood.

### Objective(s)/Method(s)

The aim of the present study was to investigate the effects of different stabilized HA and poly-L-lactic acid-based fillers with and without subsequent additional fractional laser co-treatment on skin morphology and gene expression at different time points after treatment.

### Result(s)

Intradermal injection of the different fillers into the dermal equivalent of a skin model resulted in a significant enhancement of epidermal thickness detected by histological analysis. Combining HA dermal fillers with ablative fractional CO<sub>2</sub>- or Er:YAG laser irradiation enhanced this effect. On the molecular level, gene expression profiling by microarray and qRT-PCR analysis revealed an upregu-

lation of modulators of tissue remodeling (TIMP3, SERPIN E1) and collagens (COL11A1) on day 5 after injection of the different fillers. This increase in collagen production could be caused by increased levels of transforming growth factor beta (TGF- $\beta$ ). On the other hand, we detected a downregulation of differentiation markers (FLG, LOR, KRT1) and proinflammatory cytokines (e.g. IL-36, IL-1b). Interestingly, HA-derived products revealed a specific upregulation pattern of chemokines such as CXCL5 and CCL20, in contrast to poly-L-lactic acid-based injectable dermal fillers.

### Conclusion(s)

These data suggest a secondary effect of these HA-based compounds on the immune cells of the skin, especially monocytes and macrophages. Our data showed enhancing effects of dermal fillers on epidermal thickness and prove the proliferating effects of these products on epidermal cells on the molecular level. Moreover, our findings revealed synergistic effects of fractional ablative laser treatment and HA dermal filler injection suggesting a combination of both treatments.

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## No drain closure in abdominoplasty – better outcomes, faster recovery

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### Background

Conventional abdominal closure involves multi-layered closure and insertion of drains. It has however been established that progressive tension suture (PTS) is comparable to conventional closure. We modified the original PTS technique by 1) midline interdigitation and 2) cinching of the lateral abdominal flap to the lateral border of the rectus muscle to achieve a slim silhouette, create the illusion of a toned muscle wall and eliminate dog ears without the need to extend the initial incision. In addition, given that our local population tend to prefer to be hospitalised until all drains are removed, we wanted to determine if the presence of drains delays time to mobility as well as hospital stay unnecessarily.

### Methods

A single centre, single surgeon retrospective study was performed over a three-year period. Patients undergoing abdominoplasty were included. Data collected included demographics, conventional closure or PTS technique, date of fitness for discharge, date of discharge, and complications. Fitness for discharge was defined as the day

the physiotherapist deemed the patient safe for independent ambulation.

### Results

A total of 34 patients were recruited. The first 25 patients underwent conventional abdominal closure. The subsequent nine patients underwent abdominal closure using PTS technique. Only one out of nine (8.9%) patients in the PTS group developed complication (partial peripheral umbilical necrosis) versus five out of 25 (20%) patients in the conventional group ( $p=0.046$ ). No patient required dog ear revision. Patients in the PTS group were fit for discharge earlier at 4.1 days versus 5.6 days ( $p=0.064$ ) and also discharged nearly twice as fast at 4.7 days versus 8.2 days ( $p<0.001$ ). All patients reported a satisfactory outcome after abdominoplasty.

### Conclusion

We were able to achieve an aesthetic abdomen using our modifications. The PTS technique also resulted in faster time to fitness for discharge and shorter hospital stay.

# Poster abstracts

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## A Rare Case of Persistent Unilateral Gestational Gigantomastia

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### Introduction

Gestational gigantomastia or gravid macromastia, is a rare, benign condition of unknown aetiology characterised by diffuse, extreme hypertrophy of one or both breast during pregnancy. It is estimated that 1 in every 28,000 to 100,000 pregnancies are affected to some extent by gestational gigantomastia. The aetiology of gigantomastia is uncertain. Although benign in nature, it may cause severe morbidity, and even mortality.

### Results

We present a rare case of right sided unilateral gestational gigantomastia in a 34-year-old Indonesian woman 24 months post-partum. In addition to chronic back pain and breast asymmetry, this condition was severely debilitating to her activities of daily living, including caring for her children. She underwent a breast reduction with free nipple grafting. Total breast tissue excised was 2.25kg. The patient reported instant relief of her back and shoulder ache. Initial follow-up at 1 and 6 weeks were satisfactory, with good wound healing and no evidence of

complication. The patient was extremely pleased with the outcome

### Conclusions

Management of gigantomastia is divided into conservative and surgical approaches. Following cessation of the causative stimulating factor, observation is adopted due to potential involution of the breast tissue. However, once significant hypertrophy has occurred it does not appear to regress. Surgical treatments include breast reduction, or mastectomy, with or without reconstruction. Free nipple grafting may be required in massive gigantomastia, but is associated with reduced nipple projection, sensation, and inability of lactation. Mastectomy is usually reserved for those who have recurrent gigantomastia following reduction. It is important that patients are adequately counselled as to the risks of recurrent gigantomastia if undergoing a reduction, particularly in the setting of further pregnancies. Mastectomy may also be necessary in the setting of life-threatening complications of gigantomastia, such as infection and haemorrhage. 

# Poster abstracts



Figure 1. Initial presentation at 32 weeks of pregnancy with her second child.

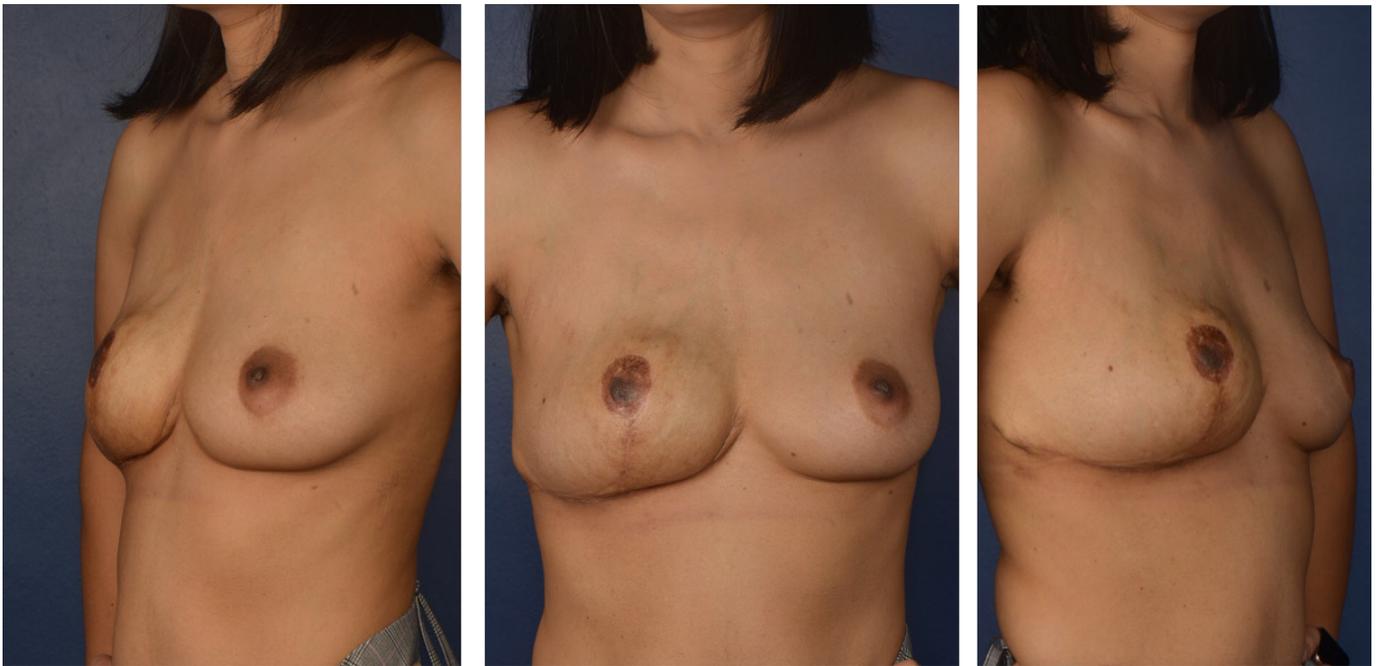


Figure 2. Six months post-operative result.

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## Effect after injections of stabilized cooperative hybrid complexes of hyaluronic acid<sup>1</sup> in upper and lower aging eyelid

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### Introduction

We have many non-surgical options to reducing the excess skin around the eye, tightening the loss of elasticity.

Superficial cross-linked hyaluronic acid injections in orbital area is not optimal, due to edema of a chronic character. We know clinically that stabilized hybrid complexes in cases of accidental injection sites, near the orbital rim, a slight edema has occurred but lasted no longer than 14 days.

Stabilized hybrid complexes of hyaluronic acid is known to support keratinocytes, fibroblasts and adipocytes viability leading to a remodeling of the extracellular matrix in terms of elasticity and support.<sup>2</sup>

### Methods

Clinical study: observational, monocentric, retrospective and prospective

Treatment: T0 first treatment T1 second treatment after one month T3 control one month after 2nd treatment, 4 injection sites with 0.1ml bolus each eye.

Patients: Inclusion criteria male or female. Age > 35years and < 80 years. Upper eyelids do not cross the lash line. Snap test < 2seconds. Moderate facial photo aging, as determined by visual analog scale. VAS score <7 = moderate degree of photoaging; VAS score >7=high degree of photoaging. Exclusion: Previous tear trough treatment. Four women aged 50-52years, one man 54 years.

Documentation: Photography by HD camera.

### Results

Increased elasticity, reduced excess skin and fine lines in upper and lower eyelids. High satisfaction for both the physician and the patient just after the first treatment, all with local edema 1-6 days after treatment.



1. Efficacy, Safety, and Tolerance of a New Injection Technique for High- and Low-Molecular-Weight Hyaluronic Acid Hybrid Complexes. Carmen Laurino, MSc, Beniamino Palmieri, MD, Alessandro Coacci, MD
2. Hyaluronan Hybrid Cooperative Complexes as a Novel Frontier for Cellular Bioprocesses Re-Activation. Antonietta Stellavato, Luisana Corsuto, Antonella D'Agostino, Annalisa La Gatta, Paola Diana, Patrizia Bernini, Mario De Rosa, Chiara Schiraldi