FACE WRINKLES

An Essay Submitted for the Partial Fulfilment of the Masters Degree in Dermatology and Venereology

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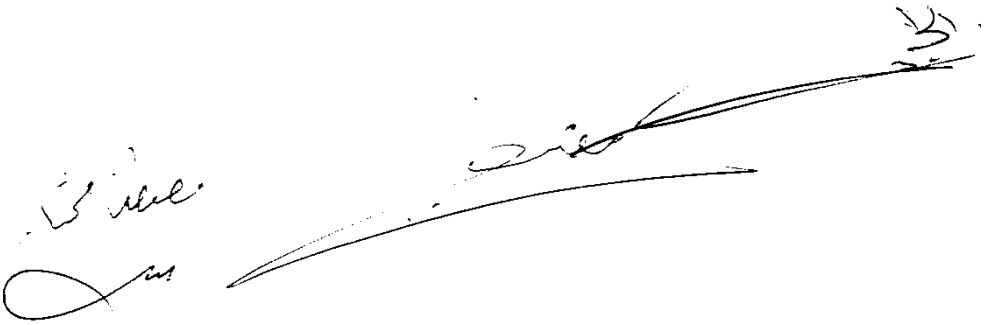

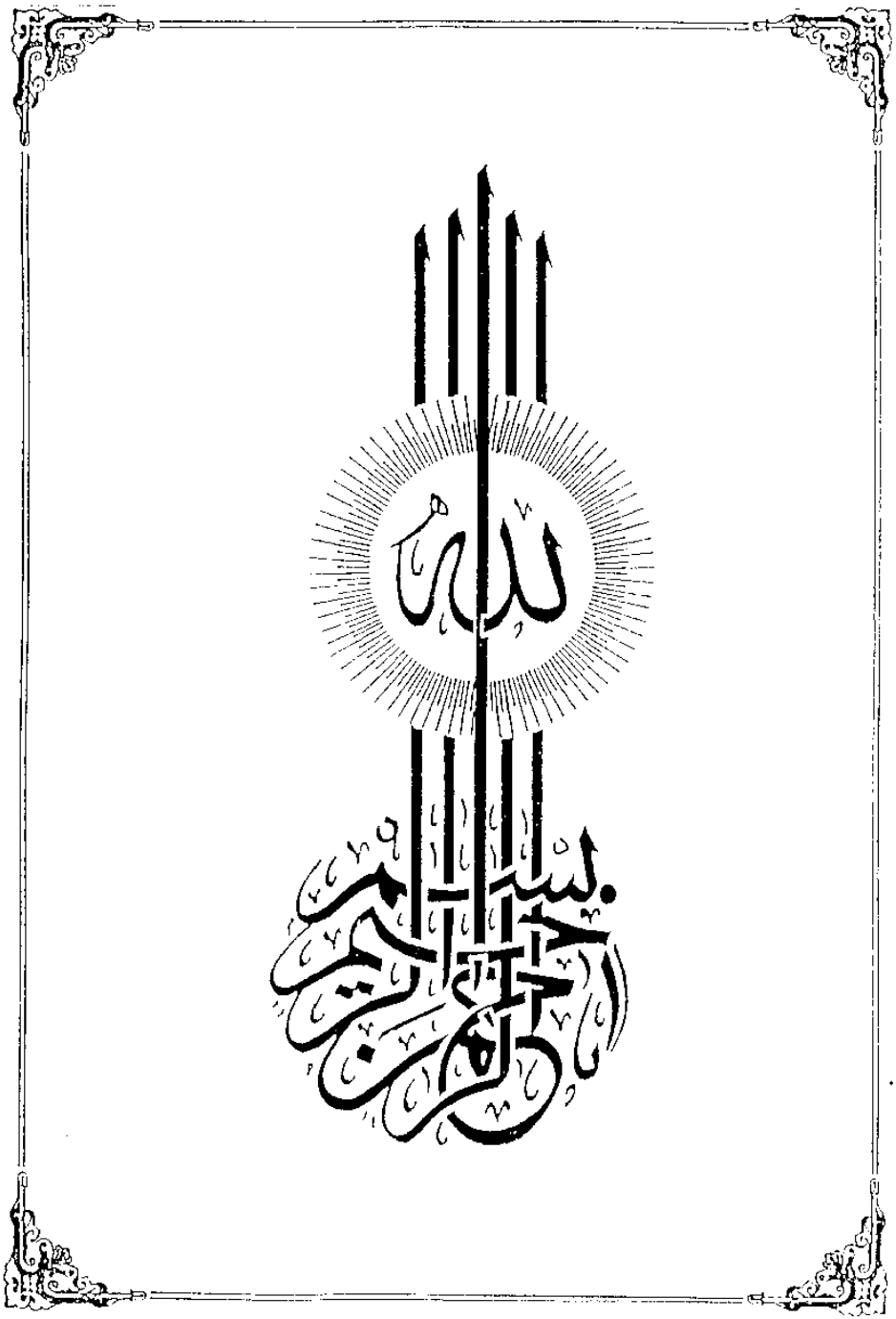

To my family

Thank you for being so helpful, supportive and understanding

Acknowledgements

I would like to express my profound and sincere appreciation to Prof. Dr. Zeinab El-Gothamy, Professor of Dermatology and Venereology, Ain-Shams University, for her continuous encouragement, wholehearted support, sound criticism and enthusiastic help that made this work possible.

I was fortunate to carry out this work under the guidance of Dr. Mahira Hamdy El-Sayed, Assistant Professor of Dermatology and Venereology, Ain-Shams University, who offered me much of her time and experience.

Finally, I would like to thank the staff members at the Department of Dermatology, my colleagues, friends and my family for their sincere support during the accomplishment of this work.

Noha Aref

CONTENTS

❒ **Introduction** 1

❒ **Review of Literature** 3

□ **Basic Structure of the Skin** 3

□ **Types of Wrinkles** 10

□ **Causes of Wrinkles** 13

■ **Aging** 13

- Intrinsic Aging 13

- Extrinsic Aging 20

■ **Other Causes** 31

- Premature Aging Syndromes 31

- Cutis Laxa 31

- Mid-dermal Elastolysis 32

□ **Assessment of Face Wrinkles** 33

■ **Clinical Scoring Techniques** 33

■ **Photonumeric Scales** 33

■ **High Resolution Facial Photography** 36

■ **Skin Replica Analysis** 37

□ **Approaches to Face Wrinkles** 42

■ **Prophylactic Measures** 43

- Sunscreens 43

- Antioxidants 46

■ **Therapeutic Measures** 47

- Medical Treatment 48

Topical Retinoids 48

Marine Fish Cartilage Polysaccharides 64
Cosmetic Products 65
- Augmentation Therapy 66
Bovine Collagen Implants 66
Injectable Liquid Silicon 73
Fibrel 75
Autologous Fat Transplants 77
Thread Augmentation 81
- Peeling 84
Histological Changes in Peeled Skin 85
Patient Selection 87
Types of Peels 88
General Complications of Peels 111
- Aesthetic Surgery 117
❒ **Summary and Conclusions** 118
❒ **References** 125
❒ **Arabic Summary**

LIST OF ABBREVIATIONS

- **BMZ** Basement Membrane Zone.
- **Co2** Carbon Dioxide.
- **CRABP** Cytoplasmic Retinoic Acid Binding Protein.
- **DNA** Deoxyribonucleic Acid.
- **EACA** Epsilon Aminocaproic Acid.
- **E-PTFE** Expanded Polytetrafluroethylene.
- **FDA** Food and Drug Administration of the United Department of Health and Human Services.
- **GAGs** *Glycosaminoglycans.*
- **GP** Glutathione Peroxidase.
- **H&E** Hematoxylin - Eosin.
- **MED** Minimal Erythema Dose.
- **MPD** Minimal Phototoxic Dose.
- **NASA** National Aeronautics and Space Administration.
- **PPF** Phototoxic Protection Factor.
- **RAR** Retinoic Acid Receptor.
- **RNA** Ribonucleic Acid.
- **SOD** Superoxide Dismutase.
- **SPF** Sun Protection Factor.
- **TCA** Trichloroacetic Acid.
- **UVAPF** Ultraviolet A Protection Factor.
- **UVR** Ultraviolet Rays.

INTRODUCTION

Wrinkles can be defined as lines, creases, or furrows occurring on the skin surface,[1] reflecting the underlying alterations in the delicate architecture of the dermal connective tissue.[2] Although face wrinkles can be caused by a wide variety of etiological factors, aging comprises the most common of all. Cutaneous aging may be characteristically caused by a biologically determined intrinsic process, superimposed by the cumulative effects of environmental assaults, most important of which are sunlight, smoking, and air pollution.[3]

Wrinkles can have a deleterious consequence on the psychological well being of the elderly. Physical attractiveness is important in obtaining social advantages that improves the quality of life, with cosmetic acceptability being associated with a youthful non aged appearance. Furthermore, individuals who look old, tend in fact to be older by their physiologic criteria. Consequently, preserving the youthful appearance confers psychological and perhaps even physiological benefits.[4]

The impact of aging is rapidly increasing throughout the world as a result of increased life expectancy, and hence larger population of middle-aged and elderly individuals. Life long exposure to the sun and evidence of decreased protective ozone layer are also contributory factors to the increased incidence of these impacts. Consequently, avoidance of sun exposure during the midday hours, together with the application of sunscreens when outdoors, would significantly reduce the severity of photoaging.[3]

Therapeutic intervention to counteract the aging process and photodamage has been attempted with various procedures. Medical therapy in the form of the daily application of topical medications, including tretinoin and the recently evolving natural cartilage polysaccarides, although arduous,

produces correction of the underlying process of aging. Some currently acceptable approaches for the rehabilitation of the aging face include the collagen implantation, microlipoinjection, chemical peeling, dermabrasion, cryopeeling, thermabrasion, and face-lift operations. These procedures, which are essentially cosmetic, do not actually treat the underlying problems of cutaneous aging and photodamage. Each of these treatment modalities has its risks and limitations, though when properly performed in the appropriate patient, usually produces a significant improvement in the appearance with little associated adverse effects.[1]

This essay reviews the features and the pathophysiology of cutaneous aging, as the commonest cause of face wrinkles, and some of the measures used to evaluate, prevent, reduce, or remove this cosmetically disabling disorder.

REVIEW OF LITERATURE

BASIC STRUCTURE OF THE SKIN

The skin is composed of three anatomically distinct layers. From the surface inwards, these are the epidermis, dermis, and subcutis.[5] The epidermis is composed primarily of ectodermally derived keratinocytes. These differentiate while moving from the basal layer of the epidermis to its outermost layer, the stratum corneum. Pigment producing melanocytes and antigen presenting Langerhans cells, are additional cell types found in the epidermis.[6, 7, 8]

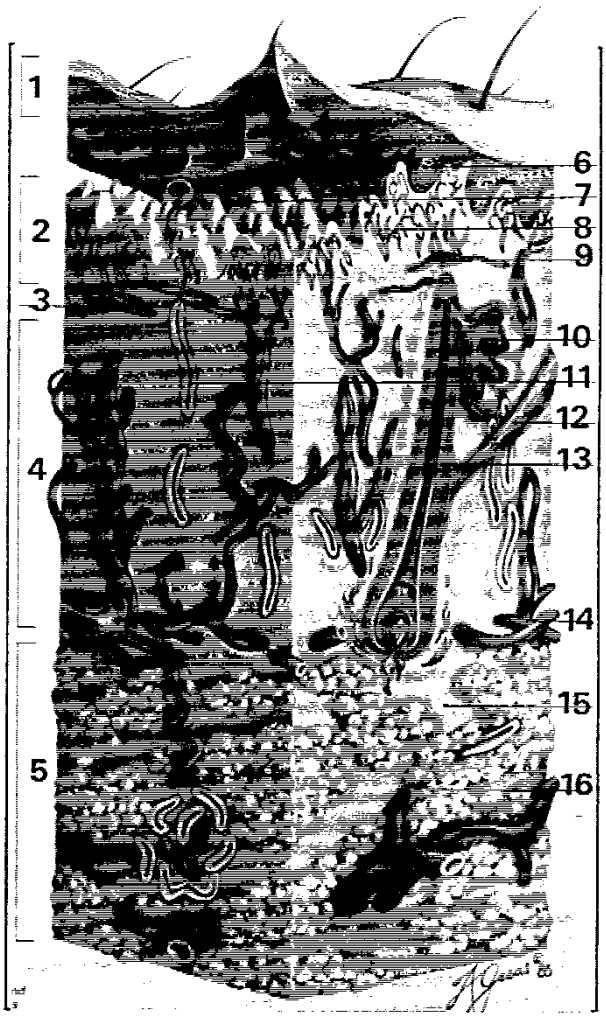

Fig. 1: Synoptic view of cutaneous architecture.
[1]-Epidermis [2]-Papillary dermis [3]-Periadnexal dermis
[4]-Reticular dermis [5]-Subcutaneous fat [6]-Rete ridge [7]-Papilla
[8]-Papillary capillary loops [9]-Superficial plexus of blood vessels
[10]-Sebaceous gland [11]-Dermal duct of eccrine sweat gland
[12]-Arrector pili muscle [13]-Hair follicle [14]-Deep plexus of blood vessels
[15]-Connective tissue septum [16]-Lobules of adipose tissue
(**Geras A.J., 1990:** The form and function of normal skin. In: Dermatology: A Medical Artist Interpretation. Sandoz Medical Puplications: Switzerland, pp 17)

The dermis, contributing to 15-20% of the total weight of the human body, is variable in thickness from about 1 mm on the face to 4 mm on the back.[9] It can be conveniently divided into two distinct compartments, the thin papillary dermis, interdigitating with the ridged undersurface of the epidermis, and the reticular dermis, comprising nine tenths of the total dermis, extending down to the subcutis (Figure- 1).[5]