

Anatomo-radiological Study of the Superficial musculo-aponeurotic system of the Face

Macchi Veronica¹, Tiengo Cesare³, Porzionato Andrea¹, Stecco Carla¹, Galli Sergio¹, Vigato Enrico³, Azzena Bruno³, Parenti Anna², De Caro Raffaele¹

¹Department of Human Anatomy and Physiology, Section of Anatomy, University of Padova, Italy

²Department of Medico-Diagnostic sciences and special therapies, section of Pathology

³Department of Medical and Surgical Sciences, Section of Plastic Surgery

Key words: face, SMAS, subcutaneous tissue, CT, MR

SUMMARY

The aim of the study was to analyse the appearance of the superficial musculo-aponeurotic system (SMAS) in radiological images (Magnetic Resonance -MR- and Computed tomography -CT- scans, 10M, 10F randomly selected) in the three regions of the face (the parotid and cheek regions and the nasolabial fold). In axial CT images, the SMAS appears as a relatively hyperdense tortuous line between the hypodense superficial fibroadipose tissue (SAT) and the hypodense deep adipose tissue (DAT). In parotid region SAT is well represented (mean thickness 4.32 ± 2.9 mm), whereas DAT is very thin (0.33 ± 0.48 mm); SMAS appears as a thin hyperdense line, close to the parotid gland (0.76 ± 0.43 mm). In cheek region, SAT is well represented (5.57 ± 1.17 mm), whereas DAT is thinner (2.94 ± 0.62 mm), and SMAS is well recognisable (1.69 ± 0.52 mm). At the level of the nasolabial fold, the SAT is poorly represented (0.37 ± 0.06 mm); the SMAS continues in the mimic muscles (2.41 ± 0.05 mm), and DAT shows a mean thickness of 2.15 ± 0.63 mm. In the MR examination, the SMAS appears as a thin continuous line hypointense in the T1- and T2-weighted sequence, from parotid region to nasolabial fold, comprising mimic muscles in the anterior region of the cheek and at the level of the nasolabial fold. No significative differences in thickness between CT and MR were found. Our anatomo-radiological study confirms that the subcutaneous architecture of the face consists of multiple layers of tissues that connect facial muscles with the dermis. This pattern of arrangement shows a progressive centrifugal thinning towards the adjacent regions.

INTRODUCTION

From the original description of the superficial musculo-aponeurotic system (SMAS) of the face in the '70 (Mitz and Peyronie, 1976), its surgical dissection, mobilization and traction has become an ordinary technique in aesthetic facial surgery. The term SMAS has been universally accepted in scientific literature as well as in clinical practice. A variety of SMAS dissections with its traction or plication