

Relationship between pathological scars and mechanical factors  
on the anterior chest

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Mechanical stimuli, particularly skin stretching, are thought to drive keloid initiation and progression. However, the precise roles of these stimuli remain to be clarified. Facial and cervical keloids are rare despite daily stretching of the skin due to posture changes and facial expressions. To study the role of mechanical factors in facial/cervical keloids, we finely mapped these keloids in 25 patients on the basis of clinical photographs. Five healthy volunteers were then asked to sit with a neutral facial expression, lie supine with a neutral expression, or sit with an exaggerated grimace. The effect of posture or facial expression change on the stretching, stiffness, and thickness of the skin at each part of the face and neck relative to sitting with neutral expression was then determined. The results showed that facial/cervical keloids were most prevalent at the mandibular angle, followed by the lateral submental site. Moreover, these keloid-predilection sites associated with particularly high skin stretching, stiffness, and thickness changes on posture/expression changes. Thus, along with skin stretching, skin stiffness and thickness may play important roles in keloid formation and progression.