Paper:

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Lore’s fascia and the platysma-auricular ligament are distinct structures

Justin X. O’Brien a,*, Warren M. Rozen a,c, Iain S. Whitaker b, Mark W. Ashton a,c

a Taylor Laboratory, Room E533, Department of Anatomy and Neuroscience, University of Melbourne, Grattan St, Parkville, 3050 Victoria, Australia
b Department of Plastic, Reconstructive and Burns Surgery, The Welsh Centre for Burns and Plastic Surgery, Morriston Hospital, Swansea, UK

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Summary  Background: Lore’s fascia and the platysma-auricular ligament are discreet fascial structures anterior and inferior to the auricle respectively. The nomenclature and descriptions of these structures have been presented inconsistently in the literature. There is also concern that placement of platysma suspension sutures into these structures may risk damage to the underlying facial nerve trunk. The aim of this study was to clarify the anatomy of Lore’s fascia and the platysma-auricular ligament, and their relationship to the facial nerve trunk.

Materials & methods: A cadaveric study utilising twelve fresh cadaveric hemi-faces was undertaken, investigating the anatomy of Lore’s fascia and the platysma-auricular ligament. This comprised dissection of the periauricular fascial layers and identification of the relationship of these two structures to the facial nerve trunk. A histological study of Lore’s fascia was performed.

Results: Lore’s fascia and the platysma-auricular ligament were identified in all 12 hemi-faces. The structures were anatomically distinct in all cases. The relationship of the facial nerve was documented in each case, with the facial nerve trunk found to lie at least 2 cm deep to the most superficial parts of both structures. Lore’s fascia was demonstrable with histology.

Conclusions: Lore’s fascia and the platysma-auricular ligament are separate and consistently demonstrable structures. Both are suitable for platysma suspension sutures in terms of facial nerve trunk safety, and Lore’s ligament can be used as a guide to facial nerve preservation in parotidectomy.

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Introduction

Lore’s fascia\(^1\) and the platysma-auricular ligament\(^2\) are discreet fascial structures anterior and inferior to the auricle respectively. Either can be used for the placement of platysma suspension sutures during platysmaplasty. The nomenclature and descriptions of these structures have been presented inconsistently in the literature. There is also concern that placement of platysma suspension sutures into these structures may risk damage to the underlying facial nerve trunk. The aim of this study was to clarify the anatomy of Lore’s fascia and the platysma-auricular ligament, and their relationship to the facial nerve trunk, using a fresh cadaver dissection study.

Lore’s fascia

The first reference to this fascia was by Lore in 1973 when he described the “temporoparotid fascia” as one of six useful landmarks for finding the main trunk of the facial nerve during parotidectomy.\(^1\) The fascia was described as a band running from the tympanomastoid fissure to the superficial surface of the parotid gland, with the main trunk of the facial nerve lying directly beneath it.\(^1\)

In 2006, Labbe described the use of the temporoparotid fascia (which he called “Lore’s fascia”, and the “tympanoparotid fascia”) as a fixation point for platysma suspension during neck-lift procedures.\(^3\) Suspension of the platysma from Lore’s fascia resulted in good definition of the mandibular rim and the anterior border of the sternocleidomastoid and also the lifting and support of the submandibular gland.\(^3\) Due to the bony and cartilaginous origins of Lore’s fascia, the position of the earlobe was not affected by the suspension of the platysma from the fascia.\(^3\) Fogli described Lore’s fascia as ‘merging’ with another structure, the platysma-auricular ligament to compose a fibrous, homogenous, dense, and solid tissue which served as an anchor for platysma in his neck-lift technique.\(^4\)

Hwang subsequently investigated the anatomy of Lore’s fascia in a cadaveric dissection, tensiometry, and histology study.\(^5\) Lore’s fascia was found to be consistently demonstrable by both dissection and histology. Tensiometry of Lore’s fascia and of the sternocleidomastoid fascia showed those two structures to have equal strength.\(^5\)

Most recently, Rohrich et al. performed a study to investigate great auricular nerve injury during neck lifting. Throughout their article they referred to fascia inferior to the auricle as ‘Lore’s fascia’, and stated that the great auricular nerve entered Lore’s fascia at a point 6.5 cm inferior to the external auditory canal,\(^6\) departing from the description of the fascial band initially described by Lore, and later confirmed by Labbe, Fogli, and Hwang.\(^3\)–\(^5\)

An overview of the terms used for the band of fascia running from the tympanomastoid fissure to the superficial surface of the fascia overlying the parotid gland is presented in Table 1.

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>Terminology</th>
</tr>
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<tbody>
<tr>
<td>Lore(^1)</td>
<td>1973</td>
<td>Temporoparotid fascia</td>
</tr>
<tr>
<td>Labbe(^3)</td>
<td>2006</td>
<td>Lore’s fascia</td>
</tr>
<tr>
<td>Fogli(^4)</td>
<td>2008</td>
<td>Tymanoparotid fascia</td>
</tr>
<tr>
<td>Hwang(^5)</td>
<td>2008</td>
<td>Lore’s fascia</td>
</tr>
<tr>
<td>Uplie(^7)</td>
<td>2010</td>
<td>Temporoparotid fascia</td>
</tr>
<tr>
<td>Hodgkinson(^8)</td>
<td>2011</td>
<td>Lore’s fascia</td>
</tr>
</tbody>
</table>

The platysma-auricular ligament

The platysma-auricular ligament was originally described by Furnas as a recession of the platysma into an intricate condensation that often attaches intimately to the overlying skin. The structure was found to provide firm anchorage between the platysma and the dermis of the inferior auricular area and the lower part of the parotid gland.\(^2\)

Mustoe described the adherence of the platysma to the investing layer of the deep cervical fascia over the sternocleidomastoid and the importance of releasing these ‘cervical retaining ligaments’ in his modified deep plane rhytidectomy.\(^9\)

Materials & methods

Twelve fresh cadaveric hemi-facial dissections were performed over a one year period at the University of Melbourne. Two male and four female cadavers aged between 67 years and 84 years, mean 74 years were studied. No surgery had been performed on the region studied in each cadaver. Digital macro photography (Canon EOS 400d) was used to record the results. Photoshop CS5 was used for the labelling of structures. A histological study was performed on one of the cadaveric hemi-faces with Masson Trichrome and H&E stains.

An incision was made along the anterior border of the auricle from the superior aspect of the tragus to a point 5 cm directly below the auricular lobule. The dissection...
proceeded in the sub-SMAS plane from the skin incision to the anterior border of the parotid gland and 5 cm anterior to the angle of the mandible. The elevated flap was then retracted anteriorly to induce tenting of Lore’s fascia. The superficial surface of the platysma-auricular ligament was identified visually and the parotid gland was dissected at its posterior aspect to display the depth of the facial nerve trunk as it emerged from the stylomastoid foramen. Measurements of the dimensions and relative positions of the platysma-auricular ligament, tragal pointer, facial nerve trunk, and Lore’s fascia were taken from each specimen during the dissection.

Figure 2 Transverse view of Lore’s fascia. The posterior attachment merges with the perichondrium of the auricular cartilage. Note the deeper parts coursing deep to the auricular cartilage.

Figure 3 The relationship of Lore’s fascia to the tragal pointer and facial nerve trunk (CNVII). Left side of the face.

Figure 4 Masson Trichrome stain of the fascia overlying the posterior part of the parotid gland (coronal slice). Lore’s fascia is visible as a discreet bundle of collagen fibres. The dashed line shows the position of Lore’s fascia in relation to the intertragal incisure.

Figure 5 The platysma-auricular ligament — PAL.

Figure 6 The attachment of the platysma-auricular ligament to the auricular cartilages.
Results

Lore’s fascia was demonstrated in all dissections as a discreet band over the posterior aspect of the parotid gland at the level of the intertragal incisure. At approximately 1.5 cm (mean 1.5 cm, SD 0.3 cm) anterior to the incisure, Lore’s fascia was found to merge with the superficial fasciae overlying the parotid gland. (Figure 1).

The posterior attachment of Lore’s fascia was extensive, and merged with the perichondrium of the auricular cartilage to the depth of the tympanomastoid fissure. (Figure 2). Further dissection down to the facial nerve trunk necessitates resection of the deeper attachments of Lore’s fascia. (Figure 3). The tragal pointer was found to be 1 cm deep (mean 1.1 cm, SD 0.2 cm) to Lore’s fascia, and 1 cm superior and superficial to the facial nerve trunk.

Lore’s fascia was clearly seen on histology as a separate structure to the other superficial fasciae overlying the posterior region of the parotid gland. (Figure 4). It was not identifiable on histology at a point 2 cm anterior to the intertragal incisure.

The platysma-auricular ligament (PAL) extends 5–6 cm from the auricle in an inferior direction along the posterior border of the platysma muscle and was approximately 2 cm wide (mean 1.8 cm, SD 0.2 cm). It was clearly visible as a condensation of the superficial cervical fascia (platysma fascia) when viewed from the superficial aspect. (Figure 5).

The most superior extent of the PAL is at the inferior border of the auricular cartilage where the PAL merges with the perichondrium. (Figure 6). It is a separate structure to Lore’s fascia. (Figure 7).

Sharp dissection was required to separate the PAL from the underlying sternocleidomastoid fascia (investing layer of deep cervical fascia). Conversely, the platysma muscle itself was easily separable from the deep fascia in all other regions by blunt dissection.

The platysma-auricular ligament links the deep and superficial fasciae, in this case, the investing layer of deep cervical fascia over the sternocleidomastoid muscle, to the superficial cervical fascia investing the platysma. (Figure 6).

Discussion

Lore’s fascia, which has also been named the ‘temporoparotid fascia’ and the ‘tymanoparotid fascia’ is a discreet fascial band running from the tympanomastoid fissure and adjacent auricular cartilage to the fascia overlying the parotid gland. It was first described by Lore1 as a landmark for the facial nerve trunk, but more recently has attracted interest in the placement of platysma suspension sutures in neck lifting. The bony origin of Lore’s fascia allows for tensioning without displacement of the auricle.

The platysma-auricular ligament described by Furnas2 is a separate structure to Lore’s fascia. Both structures are sufficiently strong to support platysma suspension, and are at least 2 cm superficial to the facial nerve trunk. When platysma suspension sutures are placed in the immediate vicinity of the auricle and into either of these two structures, the comparative depth of the facial nerve trunk makes it safe from interruption by suture placement.

The platysma-auricular ligament was found to have extensive attachment to the lower auricular cartilages, which has not previously been described.

Conflicts of interest
None.

Declarations
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References