

# Prevention of Frey syndrome with superficial temporal fascia interpositioning: a retrospective study

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**Abstract.** Frey syndrome (FS) is a commonly documented postoperative complication following parotidectomy. The aim of this study was to clinically evaluate the efficacy of superficial temporal fascia (STF) as interpositioning barrier between the overlying skin flap and the parotid bed for the prevention of FS following superficial parotidectomy. A retrospective study was designed involving a population of patients from a single institution who underwent superficial parotidectomy for parotid tumours and refractory chronic sialadenitis from 2008 to 2011. Forty-eight cases were identified and divided into two groups: group I ( $n = 25$ ) had undergone STF interpositioning between the skin flap and the parotid bed after extending the modified Blair's incision in the temporal region, and group II ( $n = 23$ ) had undergone a superficial parotidectomy using the modified Blair's incision without any interpositioning. In group I, one of 25 cases (4%) developed mild FS; in group II, nine of 23 cases (39.1%) developed FS of varying severity. There were no cases of permanent facial palsy in either group. Alopecia along the temporal extension of the incision line was imperceptible in all group I cases. The use of an STF interpositioning barrier between the overlying skin flap and the parotid bed is a safe and effective procedure for the prevention of FS following superficial parotidectomy.

**Keywords:** superficial temporal fascia; Frey syndrome; superficial parotidectomy; chronic sialadenitis; benign tumours.

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Frey syndrome (FS) is a clinical condition characterized by sweating and flushing of the facial skin during mastication. The condition, previously thought to be rare, is now recognized as a common sequela to parotidectomy, due to aberrant neuronal regeneration.<sup>1</sup> A very rare case of congenital FS associated with a non-traumatic bilateral trifold mandibular

condyle has also been reported in the literature.<sup>2</sup> The frequency of FS ranges from 4% to 62%, and it usually develops at 6–18 months post-parotidectomy, or sometimes even later.<sup>3</sup> The symptoms are frequently mild, but the condition often leads to significant discomfort. The starch iodine test is used for the objective assessment of FS.

Anatomical and physiological understanding of the condition has led to the development of various prophylactic and definitive treatment modalities with varying rates of success.

Botulinum toxin injection is a safe method that provides the longest period of relief from FS with the lowest complications.<sup>4</sup> Surgical strategies such as

transection of the glossopharyngeal nerve, resection of the auriculotemporal nerve, and even a tympanic neurectomy, are of historical importance.<sup>5</sup> Studies claim that if a physical barrier is created, the risk of FS is virtually eliminated. Various allogeneic and autologous options are available post parotidectomy to create this barrier, which include acellular dermal matrix (ADM),<sup>6</sup> sternocleidomastoid flap,<sup>7</sup> superficial muscular aponeurotic system (SMAS) flap,<sup>8</sup> platysma muscle flap,<sup>9</sup> superficial temporal artery fascial flap,<sup>10</sup> de-epithelialized free flap,<sup>11</sup> and the parotid fascia.<sup>12</sup> Porcine dermal collagen grafts have also been used successfully in some studies.<sup>13</sup>

The superficial temporal fascia (STF) flap is an extension of the galea aponeurosis in the temporal region which can be rotated to cover the defect post parotidectomy. The fascia can be further extended to include the temporoparietal fascia and galea if required. It has been used extensively in head and neck surgery, not only as a graft to reconstruct intraoral and extraoral defects,<sup>14-16</sup> but also as interpositioning material following the release of temporomandibular joint ankylosis<sup>17</sup> and oral submucous fibrosis.<sup>18</sup> A combination of temporoparietal fascia (the cephalic extension of the SMAS) and the fascia of the temporalis muscle (deep temporal or STF) for the prevention of FS was first described in 1995.<sup>19</sup>

The purpose of this study was to evaluate the efficacy of STF as an interpositioning barrier between the overlying skin flap and the parotid bed for the prevention of FS following superficial parotidectomy. This is the first study on the use of STF for the prevention of FS post superficial parotidectomy in the existing oral and maxillofacial surgery literature. The study was based on the hypothesis that creating an STF barrier at the time of parotidectomy by extending the modified Blair's incision in the temporal region would eliminate the need for second surgery or expensive alternatives for the prevention of FS. The objectives were to measure the decrease in frequency of FS, to draw a comparison with cases where the above technique was not used, and to assess alopecia along the extended temporal incision line.

## Materials and methods

An analytical, single-institution, retrospective study of 48 cases was designed from a population of patients who underwent superficial parotidectomy for parotid tumours and refractory chronic sialadenitis

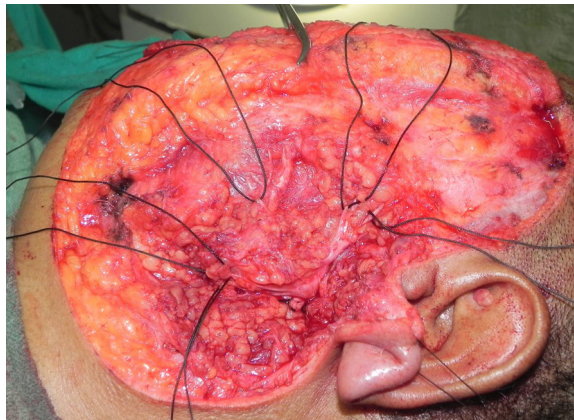


Fig. 1. Superficial parotidectomy carried out with extension of the modified Blair's incision in the temporal region.

from 2008 to 2011. Institutional ethics committee approval was obtained before undertaking the study. Cases of superficial parotidectomy with a minimum of 2 years of follow-up were included. The following patients were excluded from the study: (1) those in whom concomitant radiotherapy and chemotherapy were given post-surgery; (2) those with relevant debilitating medical conditions; and (3) those in whom a superficial parotidectomy was done for recurrences. The primary predictor variable was STF interpositioning (yes/no). The primary outcome variable of interest was the objective assessment of FS by starch iodine test (positive/negative). The secondary outcome variables included objective and subjective evaluation of alopecia at the incision site and permanent facial palsy. Other variables of interest were demographics (age, sex).

The choice of extension of the incision was given to all of the patients undergoing

a superficial parotidectomy after explaining the incidence of FS. STF interpositioning was carried out in patients who opted for extension of the modified Blair's incision in the temporal region (Fig. 1). The STF was harvested to its maximum limit from the temporal extension (Fig. 2) and rotated to cover the parotid bed (Fig. 3). In all cases, the proximal nerve identification technique was used by a single surgeon (RS) and the posterior branch of the greater auricular nerve was sacrificed. Objective assessment of FS was carried out using the starch iodine test and FS was graded as per the severity of symptoms. Complications such as permanent facial palsy and objective and subjective assessment of local alopecia along the extended incision line in the temporal region were also recorded. The  $\chi^2$  test was done to measure the association between STF interpositioning (yes/no) and the starch iodine test result (positive/negative).



Fig. 2. Superficial temporal fascia was harvested to its maximum limit from the temporal extension.

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