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Research Article

Twenty-Five-Year Outcomes of Treatment of Irreversible Facial Paralysis with Gillies and McLaughlin Techniques

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Keywords
Irreversible facial paralysis · Gillies technique · Intraoral McLaughlin technique · Extraoral McLaughlin technique

Abstract
Introduction: Data on treatment outcomes of surgical correction of irreversible facial paralysis is rare and long-term outcomes are scarce in the literature, making treatment choices difficult for operating surgeons. ***Objective:*** This study evaluated 25-year outcomes of treatment of irreversible facial paralysis with Gillies and McLaughlin techniques with a focus on general functional and age-related functional outcomes. ***Methods:*** Data of all patients who underwent surgical correction of facial paralysis using either Gillies or McLaughlin procedure between 1994 and 2018 were included in the analysis of this retrospective, single-centre study (n = 154). ***Results:*** Gillies surgery was performed on 12 and McLaughlin technique on 33 patients. Gillies and McLaughlin surgeries were associated with high patient satisfaction (75–86%), low complication rates (8–24%), and achievement of full or partial eyelid closure in 75% as well as smile reanimation in 97% of patients operated. Achievement of resting facial symmetry was low for both techniques and ranged from 27 to 46%. Age-related functional outcomes were generally superior in middle-aged patients (21–59 years) with fewer complications and reoperations compared to younger and older patients. ***Conclusions:*** Surgical correction with Gillies or McLaughlin dynamic muscle support techniques yielded good clinical results with high patient satisfaction and should, therefore, be included as a treatment option for facial reanimation of irreversible facial paralysis. Patient age may play a role in treatment outcomes and reoperation and complication rates and should be taken into careful consideration during treatment planning.

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Introduction

Damage to the 7th facial nerve can lead to permanent facial paralysis with far-reaching social and economic consequences for affected patients [1]. Treatment of irreversible facial paralysis generally requires corrective surgery and is based on the degree of severity and patient needs. Currently, a wide range of static and dynamic techniques are available including gold weight insertion in eyelids, unilateral facelift-type procedures, cross-facial nerve grafting, and free and regional muscle transfers [2, 3].

In the early 20th century, Gillies and McLaughlin both developed dynamic muscle support techniques employing sections of temporalis muscles and fascia to restore movement control to the eyelid and the corner of the mouth [4, 5]. The simplicity of the techniques generates the advantage of low complication and morbidity rates in the donor area due to the use of autologous tissue [6]. However, unpredictable results and high reoperation rates have been reported [7, 8].

There is a general lack of data on treatment outcomes of different surgical techniques used for surgical reanimation following irreversible facial paralysis, and choice of treatment protocol is largely determined by institutional preferences [9]. The aim of this study was to evaluate the long-term outcomes of Gillies and McLaughlin dynamic muscle support with focus on general functional and age-related functional outcomes.

Patients and Methods

Patients

Data of all patients who underwent surgical correction of facial paralysis using either the Gillies or McLaughlin procedure were considered for inclusion in this retrospective, single-centre study. Inclusion criteria were as follows:

- Irreversible facial paralysis for more than 24 months prior to surgery.
- Primary facial reanimation of the eye and/or mouth using either the Gillies procedure or McLaughlin dynamic muscle support alone.
- Surgery between 1994 and 2018 at our Department for Plastic and Aesthetic, Reconstructive and Hand Surgery at AGAPLESION Markus Hospital, Frankfurt am Main, Germany.

Due to the retrospective nature of the study and sheer length of the observation period no standardized outcome scoring system was used for the 25-year follow-up duration. All information on functional outcomes of facial reanimation surgery was extracted from patients' records as documented by the operating surgeon. To this day, there is no standardized outcome measurement available for facial reanimation surgery.

All relevant data was extracted from patient records as documented by the operating surgeon. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines were followed for the reporting of this study.

Surgical Protocols

The original Gillies and McLaughlin techniques were followed for facial reanimation of the paralysed eyelid and mouth. The Gillies procedure is performed using the central portion of the temporalis muscle and suturing it to the inside corner of the eye to enable active eyelid closure [4]. The middle portion of the temporalis muscle is shifted so that a thin strip of muscle fascia pulls on the upper and lower eyelid and are sutured together at the inside corner of the eye. A "sling" is formed using the middle portion of the temporalis muscle to enable active lid closure by providing dynamic support to both the upper and lower eyelid. The McLaughlin technique connects the temporalis muscle to muscles in the upper and lower lip following lengthening with strips of fascia lata to enable smile reanimation and prevent drooping of the corner of the mouth [5]. The McLaughlin technique can be performed via extraoral (preauricular sub- or transzygomatic) or intraoral (incision to the nasolabial fold) approach [10]. A skin incision is made along the nasolabial fold and subcutaneous tunnels are prepared from the skin incision site to the anterior ramus of the mandible by blunt dissection through the buccal space. Separated coronoid process and temporalis tendon are moved to the lateral oral commissure and sutured to the orbicularis oris muscles near the modiolus.

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Patients at our institution are offered the entire panel of reconstructive procedures and the pros and cons of each technique are discussed at length with every patient. Younger patients favour free gracilis muscle transfer and cross-face nerve graft or use of the nervus massetericus. Patients seeking immediate reconstructive effects generally opt for the Gillies and/or McLaughlin procedures, or lid implant and the McLaughlin procedure.

Data Analysis

All data are reported as mean ± standard deviation, and minimum and maximum values are given where appropriate. Two-sided Fisher's exact test was used to analyse differences between age groups, and a p value of <0.05 was defined as significant.

Results

Patient Characteristics and Surgical Techniques

A total of 154 patients underwent surgery for irreversible facial paralysis using nerve coaptation via the "babysitter" procedure, cross-facial nerve grafting, the Gillies procedure, McLaughlin dynamic muscle support, Gillies and McLaughlin dynamic muscle support combined, ophthalmological operations, static operations, and cosmetic symmetrizing surgery. The Gillies procedure alone was performed in 12 cases (7.8%) and the McLaughlin technique alone was used in 33 patients (21%). Additionally, intraoperative facelift was performed on 2 patients (16.7%) during Gillies surgery and on 21 patients (63.6%) who underwent the McLaughlin procedure. The ethology of facial paralysis was primarily iatrogenic resulting from surgical removal of acoustic neuroma and other operations.

Patients in both groups were mainly females (Gillies: n = 8, 66.7%; McLaughlin: n = 24, 72.7%) with only a third or less patients being male. Mean age at the time of surgery was 56.8 ± 11.4 years (range 34–70 years) in the Gillies group and 43.3 ± 18.8 years (range 9–77 years) in the McLaughlin cohort. Patients in the Gillies group underwent surgery after 274.2 ± 238.1 months (range 18–671 months) on average, while patients having McLaughlin surgery waited approximately two thirds of that time (181.2 ± 169.3 months, range 10–623 months). Mean post-surgery follow-up was 66.2 ± 85.0 months for patients in the Gillies group and 54.9 ± 93.6 months for patients in the McLaughlin group. Demographic and descriptive data are presented in Table 1.

Prior to corrective surgery all 12 patients in the Gillies group displayed incomplete eyelid closure necessitating surgical intervention (Table 2). Ectropion was noted in 7 patients (58.3%) in the Gillies group. The majority (n = 25, 75.8%) of patients in the McLaughlin group were not able to perform smile movement before surgery and 8 patients displayed gross asymmetries. Thirty-one (93.9%) patients presented with drooping of the corner of the mouth while a total of 26 (78.8%) had no motor control of the corner of their mouths (Table 3).

Functional Outcomes

Corrective surgery with the Gillies technique was able to restore complete eyelid closure in 6 cases (50%). Six patients (50%) displayed incomplete gentle eyelid closure, and surgical revision was indicated in 3 (25%) of these patients. Only 4 patients (33.3%) presented with ectropion after Gillies surgery. Facial symmetry at rest was not achieved in 8 cases (72.7%), and 6 patients (50%) later underwent a total of 12 reoperations due to incomplete correction or malfunction, scarring or pain, or acute complications. One patient (8.3%) had haemorrhage or haematoma complication, whereas 11 (91.7%) did not experience complications. Data on patient satisfaction were available for 10 patients with the Gillies procedure. The majority (n = 7, 77.8%) expressed satisfaction with the results of the surgery and 2 (22.2%) were dissatisfied (Table 2).

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Table 1. Demographic and descriptive data

	Gillies (*n* = 12)	McLaughlin (*n* = 133)
Age, years	56.8±11.4	43.3±18.8
Time to surgery, months	274.2±238.1	181.2±169.3
Follow-up after surgery, months	66.2±85.0	54.9±93.6
Aetiology of facial paralysis		
Iatrogenic	4 (33.3)	16 (48.5)
Idiopathic	1 (8.3)	4 (12.1)
Congenital disease/birth trauma	3 (25.0)	7 (21.2)
Infectious	1 (8.3)	2 (6.1)
Trauma	3 (25.0)	3 (9.1)
Tumour		1 (3.0)
Sex		
Female	8 (66.7)	24 (72.7)
Male	4 (33.3)	9 (27.3)
Intraoperative facelift		
Yes	2 (16.7)	21 (63.6)
No	10 (83.3)	36.4

Data are presented as mean ± SD or *n* (%), as appropriate.

Table 2. Functional outcomes for patients undergoing the Gillies procedure (*n* = 12)

	Prior to surgery	Post-surgery
Gentle eyelid closure		
Complete		6 (50.0)
Incomplete without indication for correction	12 (100)	3 (25.0)
Incomplete and in need of surgical revision		3 (25.0)
Ectropion		
Yes	7 (58.3)	4 (33.3)
No	5 (41.7)	8 (66.7)
Facial symmetry at rest		
Missing data		1
Achieved		3 (27.3)
Not achieved		8 (72.7)
Patient satisfaction achieved		
Missing data		3
Yes		7 (77.8)
No		2 (22.2)
Number of reoperations		12
Indication for reoperation		
Acute complications		1 (8.3)
Incomplete correction/correction malfunction		8 (66.7)
Scarring or pain		3 (25.0)
Complications		
None		11 (91.7)
Haemorrhage or haematoma		1 (8.3)

Data are presented as *n* (%) unless otherwise indicated.

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Table 3. Functional outcomes for patients undergoing the McLaughlin procedure (*n* = 33)

	Prior to surgery	Post-surgery
Smile		
Missing data		3
Yes	8 (24.2)	26 (96.7)
No	25 (75.8)	4 (13.3)
Corner of the mouth		
Missing data		3
Movement control		26 (86.7)
No movement control and no drooping	2 (6.1)	1 (3.3)
No movement control and drooping	24 (72.7)	2 (6.7)
Movement control and drooping	7 (21.2)	1 (3.3)
Facial symmetry at rest		
Missing data		7
Achieved		12 (46.2)
Not achieved		14 (53.8)
Patient satisfaction achieved		
Missing data		19
Yes		12 (85.7)
No		2 (14.3)
Number of reoperations		47
Indication for reoperation		
Acute complications		13 (27.7)
Incomplete correction/correction malfunction		27 (57.4)
Scarring or pain		6 (12.8)
Overcorrection		3 (2.1)
Complications		
None		25 (75.8)
Haemorrhage or haematoma		3 (9.1)
Wound infections		3 (9.1)
Impaired wound healing		2 (6.1)

Data are presented as *n* (%) unless otherwise indicated.

Following McLaughlin surgery, a total of 26 patients (86.7%) were able to perform smile movement (Table 3). Of these, smile movement was symmetrical in 15 cases (50%) and asymmetrical in 11 (36.7%). Smile reanimation was not achieved in 4 patients (13.3%). Twenty-seven patients (90%) had motor control of the corner of their mouths after the McLaughlin procedure and in 1 case drooping of the corner of the mouth was present. Three patients (10%) did not have motor control of the corner of their mouths, with 2 (6.7%) of these patients displayed drooping of the corner of the mouth. Resting facial symmetry was achieved in less than half (*n* = 12, 46.2%) of the patients operated on, and 23 patients (71.9%) later had 47 reoperations.

The indications for reoperations were mostly incomplete correction or malfunction of correction (*n* = 27, 57.4%), followed by acute complications (*n* = 13, 27.7%), scarring or pain (*n* = 6, 12.8%), and overcorrection (*n* = 1, 2.1%). Twenty-five patients (75.8%) did not experience complications during surgery or the postoperative healing process. Complications affected 8 patients (24.2%) and included postoperative haemorrhage or haematoma and wound infections in 3 cases (9.1%) each and impaired wound healing in 2 patients (3.1%). Data on patient satisfaction with the procedure were missing in 19 patients. Patient satis-

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Table 4. Comparison of outcomes for the McLaughlin procedure: intra- versus extraoral approach (*n* = 33)

	Extraoral (*n* = 29)	Intraoral (*n* = 4)
Smile		
Missing data	3	
Yes	22 (84.7)	3 (75.0)
No	4 (15.4)	1 (25.0)
Corner of the mouth		
Missing data	3	
Movement control	23 (88.5)	3 (75.0)
No movement control and no drooping	1 (3.8)	
No movement control and drooping	2 (7.7)	
Movement control and drooping		1 (25.0)
Facial symmetry at rest		
Missing data	7	
Achieved	10 (45.5)	2 (50.0)
Not achieved	12 (54.5)	2 (50.0)
Patient satisfaction achieved		
Missing data	17	2
Yes	10 (83.3)	2 (100)
No	2 (16.7)	
Number of reoperations	40	7
Indication for reoperation		
Acute complications	10 (25.0)	3 (42.9)
Incomplete correction/correction malfunction	24 (60.0)	3 (42.9)
Scarring or pain	5 (12.5)	1 (14.3)
Overcorrection	1 (2.5)	
Complications		
None	22 (75.9)	3 (75.0)
Haemorrhage or haematoma	3 (10.3)	
Wound infections	2 (6.9)	1 (25.0)
Impaired wound healing	2 (6.9)	

Data are presented as *n* (%) unless otherwise indicated.

faction with surgical outcomes was high, as expressed by 12 patients (85.7%) compared to only 2 patients (14.3%) who were dissatisfied.

Comparison of Intra- and Extraoral McLaughlin Approach

The open preauricular transzygomatic approach was used in a majority of the McLaughlin procedures (*n* = 29), and only 4 patients had trans-oral-buccal approach in addition to a naso-labial fold incision (Table 4). After corrective surgery with the extraoral approach, 12 patients (46.2%) were able to smile and presented normal symmetry during the movement and a further 10 (38.5%) were able to smile but showed asymmetries. In 4 patients (15.4%) with inability to perform smile movement surgical correction failed to produce smile reanimation. With the intraoral approach a symmetrical smile was possible for 3 patients (75.0%) and 1 patient (25.0%) was able to smile but presented with asymmetry.

Following surgery using the extraoral McLaughlin technique, 23 patients (88.5%) had movement control of the corner of the mouth without drooping at rest. In 1 case (3.8%) no movement control or sagging of the corner of the mouth at rest was present and in 2 cases (7.7%) without movement control drooping of the corner of the mouth persisted after surgery.

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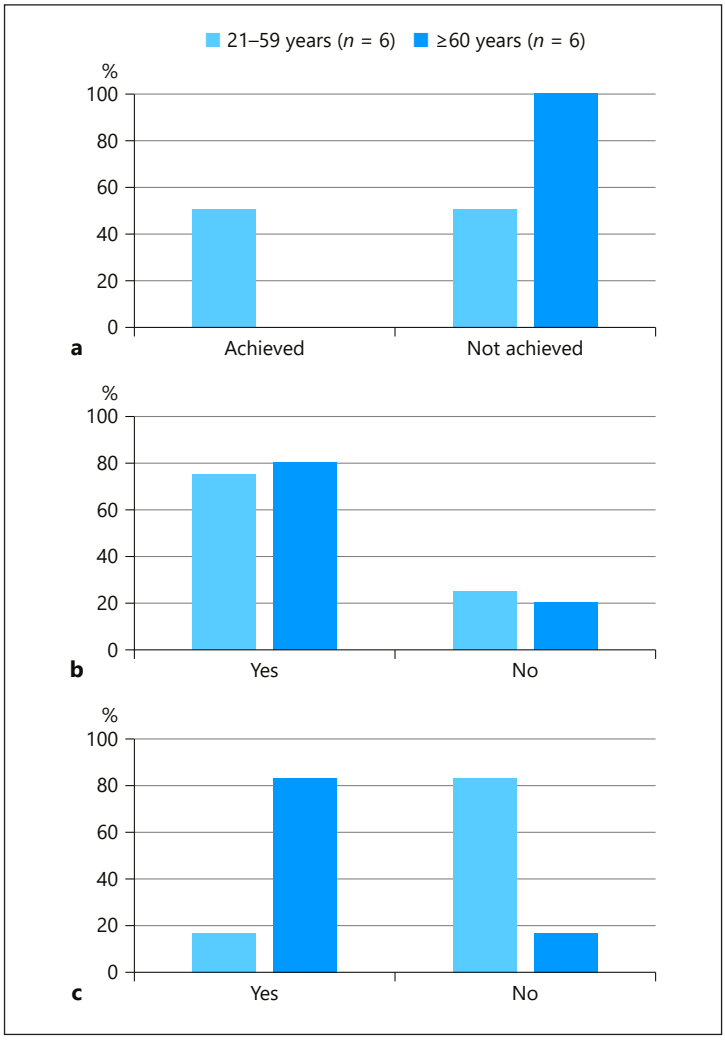

Fig. 1. Age-related functional outcomes for Gillies procedure. **a** Facial symmetry at rest. **b** Patient satisfaction achieved. **c** Reoperations (Gillies).

Three (75.0%) patients with transbuccal approach were able to smile without drooping at rest and 1 patient (25.0%) was able to smile but presented with sagging at rest. Data on patient satisfaction were missing in 19 cases. Ten patients (83.3%) with extraoral approach were satisfied by the results of the surgery whereas 2 patients (16.7%) expressed dissatisfaction. Two (100.0%) patients were content with the results of the intraoral McLaughlin approach.

Resting symmetry was achieved in 10 patients (45.5%) having open preauricular transzygomatic surgical approach and in 2 patients (50.0%) with transbuccal approach. For the McLaughlin technique and extraoral approach, a total of 40 reoperations (mean 1.9 ± 1.7; range 1–8) were documented in 20 patients. Indications for reoperations were acute complications in 10 cases, incomplete correction or malfunction of correction in 24 cases, 5 cases of scarring or pain, and 1 case of overcorrection.

In the intraoral comparison group, 7 reoperations (mean 2.3 ± 2.3; range 1–5) were performed in 3 patients. Reoperations were performed 3 times each because of acute complications and incomplete correction or malfunction of correction and in 1 case due to scarring or pain. Complications occurred in 7 patients in the extraoral McLaughlin cohort and included postoperative haemorrhage or haematoma in 3 patients and wound infections and impaired

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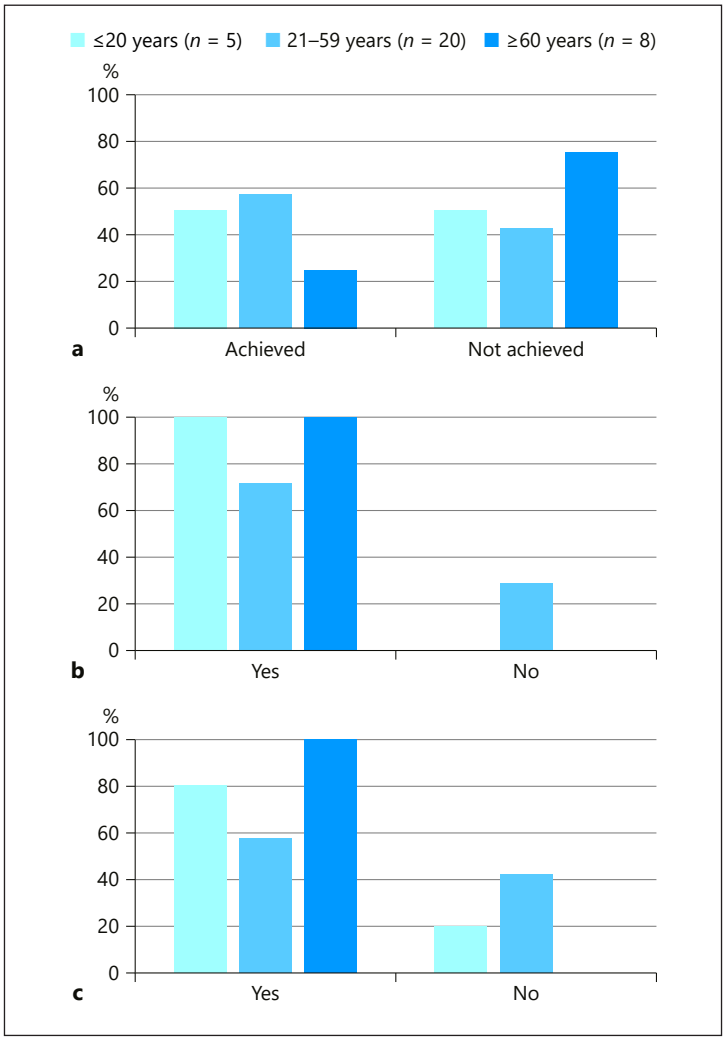

Fig. 2. Age-related functional outcomes for McLaughlin procedure. **a** Facial symmetry at rest. **b** Patient satisfaction achieved. **c** Reoperations (McLaughlin).

wound healing in 2 patients each. One patient in the comparison group developed a wound infection after surgery.

Age-Related Functional Outcomes for Patients with Gillies and McLaughlin Surgery

Six patients (50%) having the Gillies procedure were aged 21–59 years and 6 patients (50%) were aged 60 years or older. Overall, prior to corrective surgery facial paralysis prevented all 12 patients (100%) from being able to perform gentle eyelid closure, whereas ectropion was far more common in older patients. Achievement of complete gentle eyelid closure was twice as likely in middle-aged compared to older patients. Older patients were also twice as likely to require surgical revision of the initial operation due to incomplete eyelid closure. In middle-aged patients, the Gillies procedure was able to correct ectropion in both patients (33.3%) affected prior to surgery. One middle-aged patient developed ectropion following Gillies surgery. The Gillies technique led to correction of ectropion in 2 (33.3%) of the 5 (83.3%) patients originally affected.

Facial symmetry at rest was twice as successful in middle-aged patients, and 83.3% (n = 5) of older patients later underwent 10 reoperations compared with only 2 reoperations in 16.7% (n = 1) of middle-aged patients (Fig. 1). The most common indication for reoperations was incomplete correction or malfunction of correction in both age cohorts. Overall compli-

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Fig. 3. a, **b** Preoperative view of a 68-year-old male patient with idiopathic irreversible facial paralysis for 3 years.

cation rates were low, with 0% in middle-aged patients and 16.7% in older patients. Data on patient satisfaction were available for 4 middle-aged and 5 older patients. Overall satisfaction with surgical outcomes was high at 75% in patients aged 21–59 years and 80% in patients aged 60 years and older.

The majority of patients undergoing McLaughlin surgery were middle-aged. Prior to corrective surgery most patients were not able to smile at all, regardless of age cohort, and few presented with gross asymmetries while performing smile movement. Drooping of the corner of the mouth was present in 80–100% of patients independent of age. The McLaughlin procedure was most successful in producing symmetrical smile movement ability in older patients (62.5%) compared with younger (40.0%) and middle-aged patients (47.1%). Movement control of the corner of the mouth was similar for all three age groups, ranging from 80 to 88.2%.

After corrective surgery, facial symmetry at rest was achieved in 57.1% of middle-aged, 50.0% of younger, and 25.0% of older patients (Fig. 2). Thus, reoperations were most common in older patients, being performed 15 times. Reoperations were performed in 80% of young and 57.1% of middle-aged patients. The most frequently noted indication for reoperation was incomplete correction or malfunction of correction across all three groups. Acute complications accounted for the second most common indication for reoperations in all three age cohorts, affecting younger and older patients approximately 1.5 times as often as middle-aged patients. Overall complication rates were low and lowest in middle-aged patients at 85.0%. Data on patient satisfaction were available in 14 cases. Patient satisfaction with outcomes of McLaughlin surgery was very high at 100.0% for younger and older patients compared with 71.4% for middle-aged patients. Figures 3 and 4 show pre- and postoperative views of a 68-year-old male patient with idiopathic irreversible facial paralysis.

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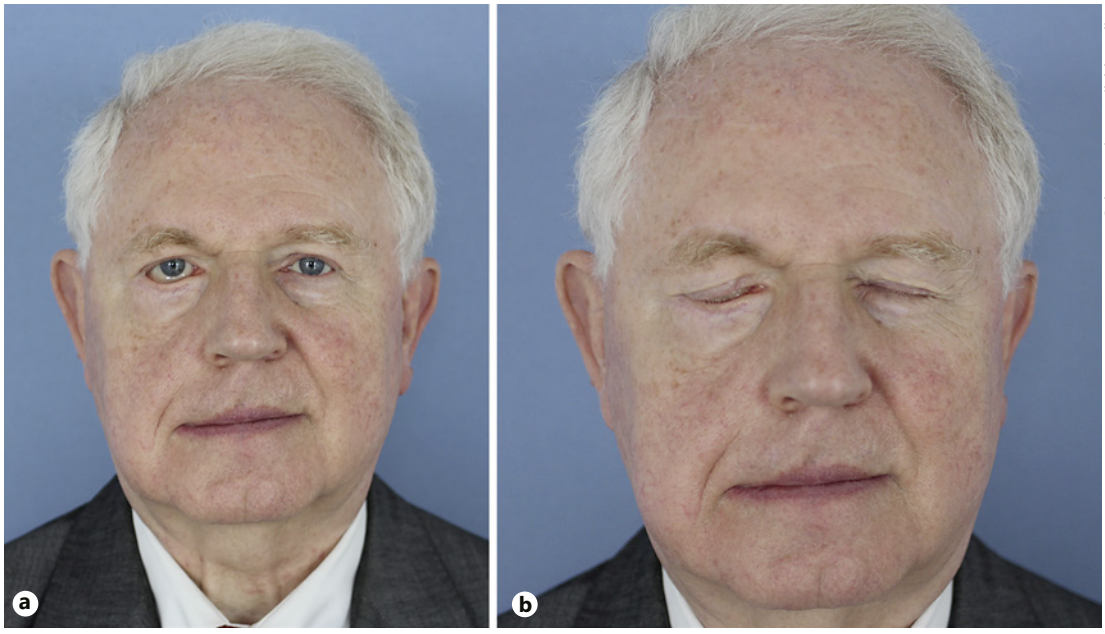

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Fig. 4. a, **b** Postoperative view of the same patient 12 months following McLaughlin dynamic muscle support, SMAS-face-neck lift, and direct brow lift left on the right side.

Comparison of middle-aged and older patients regarding patient satisfaction, facial symmetry at rest, and complication rates with Fishers' exact test were all non-significant. The respective p values were $p = 0.491$, $p = 0.204$, and $p = 0.311$. Comparison of reoperation rates showed a trend towards significance at $p = 0.061$ with more reoperations performed on older patients.

Discussion

The study findings show that surgical correction of irreversible facial paralysis with the Gillies and McLaughlin techniques were associated with high patient satisfaction and achievement of full or partial eyelid closure in 75% of all cases as well as smile reanimation in 97% of patients operated on. Comparable results have been reported in the literature [7]. The low complication rates described in the literature were confirmed in this study [7, 11–14].

Further studies have noted that facial reanimation using dynamic surgical techniques achieve better results than static operations but are often associated with higher risk of failure due to the complexity of the procedure [15, 16]. We found that facial reconstruction with single-stage dynamic muscle support techniques rarely achieved resting facial symmetry, and many patients later underwent subsequent reoperations for incomplete correction or malfunction of correction. Possible explanations are that in most cases, patients with a high degree of severity or patients with comorbidities were selected for operation using the Gillies or McLaughlin technique alone. Patient age may also have been a factor in functional outcomes, with superior functional outcomes and lower reoperation rates noted in middle-aged patients.

Overall, there is a severe lack of evidence on dynamic muscle support techniques. In a retrospective study of 605 patients, temporalis muscle transposition and lengthening myoplasty were found to be acceptable options for patients who could not receive free micro

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neurovascular muscle grafts [17]. One of the few published reviews available suggests that clinical results of modified Labbé temporalis myoplasty achieve results comparable to free micro neurovascular transfers [18]. The only systematic review on modified temporalis myoplasty found clinical results to be equal but surgically less extensive to free muscle transfer with the gracilis flap [19].

This study is primarily limited by the small number of patients who had Gillies or McLaughlin surgery and missing data which makes interpretation and generalizability of results difficult. The small sample size also limited statistical analysis which consisted primarily of descriptive statistics. Also, while over 20 unique scoring systems for assessment of outcomes of facial reanimation surgery have been published, facial palsy surgeons have yet to agree on a standardized set of assessment criteria. Standardized assessment criteria would allow comparisons to be drawn when comparing different operative techniques.

Conclusions

Surgical correction with the Gillies or McLaughlin dynamic muscle support techniques yields good clinical results with high patient satisfaction and should, therefore, be included as a treatment option for facial reanimation of irreversible facial paralysis. Patient age may play a role in treatment outcomes and reoperation and complication rates and should be taken into careful consideration during treatment planning, especially in older patients.

Statement of Ethics

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Ethics approval for the research protocol was obtained by the ethic committee of the federal states' Medical Association (FF 142/2018). Informed consent was obtained from all individual participants included in the study. Additional informed consent was obtained from all individual participants for whom identifying information is included in this article, not least the images.

Disclosure Statement

The authors have no conflicts of interest to declare.

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Author Contributions

Torsten Schlosshauer, Lara Kueenzlen, Shafreena Kuehn, Robert Sader, and Ulrich M. Rieger have (1) made substantial contributions to the conception or design of the work; (2) participated in drafting the work and revising it critically for important intellectual content; (3) approved the final version to be published; and (4) agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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References

1 Papazian MR, Campbell JH, Nabi S. Papazian, Campbell JH, Nabi S. Management of Bell's palsy. J Oral Maxillofac Surg. 1993;51(6):661–5.
2 Douglas RS, Gausas RE. A systematic comprehensive approach to management of irreversible facial paralysis. Facial Plast Surg. 2003 Feb;19(1):107–12.
3 Mehta RP. Surgical treatment of facial paralysis. Clin Exp Otorhinolaryngol. 2009 Mar;2(1):1–5.
4 Gillies H. Experiences with Fascia Lata Grafts in the Operative Treatment of Facial Paralysis: (Section of Otology and Section of Laryngology). Proc R Soc Med. 1934 Aug;27(10):1372–82.
5 McLaughlin CR. Permanent facial paralysis; the role of surgical support. Lancet. 1952 Oct;2(6736):647–51.
6 Salimbeni G. Eyelid reanimation in facial paralysis by temporalis muscle transfer. Oper Tech Plast Reconstr Surg. 1999;6(3):159–62.
7 Exner K, Kuhn T. [Gillies and McLaughlin's dynamic muscle support in irreversible facial palsy]. Dynamische Muskelersatzplastik nach Gillies und McLaughlin bei irreversibler Fazialisparese. Handchir Mikrochir Plast Chir. 2010 Apr;42(2):102–8. German
8 Aum JH, Kang DH, Oh SA, Gu JH. Orthodromic transfer of the temporalis muscle in incomplete facial nerve palsy. Arch Plast Surg. 2013 Jul;40(4):348–52.
9 Hadlock T. Facial paralysis: research and future directions. Facial Plast Surg. 2008 May;24(2):260–7.
10 McLaughlin CR. Surgical support in permanent facial paralysis. Plast Reconstr Surg (1946). 1953 Apr;11(4):302–14.
11 Labbé D, Huault M. Lengthening temporalis myoplasty and lip reanimation. Plast Reconstr Surg. 2000 Apr;105(4):1289–97; discussion 1298.
12 Hayashi A, Labbé D, Natori Y, Yoshizawa H, Kudo H, Sakai T, et al. Experience and anatomical study of modified lengthening temporalis myoplasty for established facial paralysis. J Plast Reconstr Aesthet Surg. 2015 Jan;68(1):63–70.
13 Veyssière A, Labbé D, Bénateau H. Lengthening temporalis myoplasty and facial paralysis from birth. J Plast Reconstr Aesthet Surg. 2015 Mar;68(3):312–20.
14 Panciera DT, Sampieri C, Deganello A, Danesi G. Lengthening Temporalis Myoplasty: Objective Outcomes and Site-Specific Quality-of-Life Assessment. Otolaryngol Head Neck Surg. 2017 Dec;157(6):966–72.
15 Frey M, Michaelidou M, Tzou CH, Hold A, Pona I, Placheta E. [Proven and innovative operative techniques for reanimation of the paralyzed face]. Bewährte und innovative operative Techniken zur Reanimation des gelähmten Gesichtes. Handchir Mikrochir Plast Chir. 2010 Apr;42(2):81–9. German.
16 Rabie AN, Ibrahim AM, Kim PS, Medina M, Upton J, Lee BT, et al. Dynamic rehabilitation of facial nerve injury: a review of the literature. J Reconstr Microsurg. 2013 Jun;29(5):283–96.
17 Gousheh J, Arasteh E. Treatment of facial paralysis: dynamic reanimation of spontaneous facial expression-apropos of 655 patients. Plast Reconstr Surg. 2011 Dec;128(6):693e–703e.
18 Labbè D, Bussu F, Iodice A. A comprehensive approach to long-standing facial paralysis based on lengthening temporalis myoplasty. Acta Otorhinolaryngol Ital. 2012 Jun;32(3):145–53.
19 Bos R, Reddy SG, Mommaerts MY. Lengthening temporalis myoplasty versus free muscle transfer with the gracilis flap for long-standing facial paralysis: A systematic review of outcomes. J Craniomaxillofac Surg. 2016 Aug;44(8):940–51.

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