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Case Study

Adjunctive Facial Taping as Biofeedback in the Rehabilitation of Idiopathic Bell's Palsy: A Lifespan Case Series

Elizabeth G. Harvey, PT, DPT, DHS, MSR, PCS

Renewal Therapeutics LLC

***Corresponding author**
Elizabeth G. Harvey, PT, DPT, DHS, MSR, PCS Renewal Therapeutics LLC

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Abstract

Background: Idiopathic Bell's palsy is an acute peripheral facial nerve paralysis that may result in facial asymmetry, impaired oral competence, speech disturbances, and psychosocial distress. Although many patients recover spontaneously, residual weakness and synkinesis can persist, highlighting the need for adjunctive rehabilitation strategies. Evidence supporting tactile stimulation through sensory facial taping for facial nerve palsy remains limited, particularly across age groups.

Objective: To describe the feasibility and clinical outcomes of sensory facial taping in rehabilitation for pediatric and adult patients with facial palsy.

Methods: This retrospective case series included three patients between the ages of 7 months and 26 years (two pediatric, one adult) diagnosed with facial palsy. The children received early intervention with a comprehensive team, while the adult had not pursued therapeutic intervention. Facial tape was applied to provide proprioceptive input, enhance lymphatic flow, and facilitate muscle activation and facial symmetry. Outcomes were measured using the House-Brackmann Scale, Sunnybrook Facial Grading System (adult only), and digital photography at baseline and follow-up.

Results: All patients demonstrated improvement in composite House-Brackmann scores and adult Sunnybrook scores over the intervention period. Improvements were observed in resting symmetry and voluntary movement domains, including smiling, feeding behaviors, and social interaction, with no reported adverse effects. Pediatric patients demonstrated strong adherence to tapings with caregiver support, while the adult independently managed home applications. Functional gains were noted in facial symmetry, speech articulation, oral-motor function, ptosis, epiphora, and oral competence. Caregivers and the adult patient reported satisfaction with improved facial symmetry in photographs.

Conclusion: Sensory taping appears to be a safe and feasible adjunct to interdisciplinary rehabilitation for idiopathic Bell's palsy across the lifespan. Standardized improvements in outcomes support its potential role in neuromuscular re-education. Further controlled studies are needed to determine efficacy and optimal protocols.

Keywords: Bell's palsy; facial palsy; kinesiology taping; targeted neurosensory taping (TNT); neuroplasticity; pediatric rehabilitation; sensory stimulation; proprioception; House-Brackmann scale; lifespan

Introduction

Idiopathic Bell's palsy, first characterized by Sir Charles Bell in 1831, is an acute, unilateral peripheral facial nerve paralysis resulting from injury to the seventh cranial nerve (CN VII) [1-3]. It is the most common cause of facial paralysis, occurring in 20–40 cases per 100,000 individuals annually and accounting for up to 83% of all unilateral facial palsy diagnoses [2,4]. Idiopathic acute facial palsy (AFP) further represents 30–50% of pediatric facial palsy cases, underscoring its clinical significance across the lifespan [3]. Clinically, peripheral facial palsy (FP) is classified as acute (AFP; duration less than three months) or chronic (CFP; duration greater than three months), with CFP frequently resulting in loss of resting muscle tone [3]. Beyond motor impairment, affected individuals commonly experience otalgia, xerophthalmia, epiphora, hyperacusis, dysarthria secondary to nasal obstruction, limited facial expression, and oral incompetence [2]. The cumulative functional burden, compounded by sleep dysregulation, psychosocial distress, and social isolation, highlights the significant impact of facial palsy on quality of life [5,6].

Standard management of FP typically includes corticosteroid therapy, biofeedback-based facial training, orofacial myofunctional therapy, and, in severe cases, surgical nerve reconstruction [3,7]. However, treatment protocols for pediatric populations remain limited, as corticosteroid use in children carries additional risk considerations and evidence for adjunctive physical rehabilitation in this cohort is sparse [8,9]. Even with conventional management, recent data suggest only a 68% rate of spontaneous recovery, with a 28% incidence of synkinesis, involuntary co-contraction of facial muscles that frequently persists beyond the acute phase and significantly affects functional and cosmetic outcomes [3]. These limitations underscore the need for evidence-based adjunctive rehabilitation strategies that are safe, feasible across age groups, and capable of addressing both neuromuscular re-education and functional recovery.

Elastic kinesiology taping has emerged as a promising adjunctive intervention in facial palsy rehabilitation, proposed to act by mechanically stimulating dermal mechanoreceptors to provide proprioceptive feedback, facilitate neuromuscular re-education, and enhance lymphatic flow [10-12]. Preliminary evidence in adult populations suggests that facial taping as a biofeedback tool, when used alongside physical rehabilitation, yields superior outcomes compared with rehabilitation alone [13,14]. However, evidence for taping in pediatric facial palsy populations remains virtually absent, and no studies to date have examined outcomes across the full clinical spectrum from infancy to adulthood. This retrospective case series describes the clinical application and outcomes of targeted neurosensory taping (TNT) as an adjunctive intervention in three patients with idiopathic Bell's palsy, aged 7 months to 26 years, to contribute to the emerging evidence base for this approach across the lifespan.

Methods

Study Design

This study employed a retrospective case series design to describe the clinical application and outcomes of sensory facial taping as an adjunctive rehabilitation intervention in patients with idiopathic Bell's palsy. A retrospective chart review was conducted for three patients seen by the same licensed physical therapist (PT) across an outpatient and early intervention setting. As a retrospective descriptive case series involving routine clinical care, this study was exempt from formal Institutional Review Board (IRB) review. All patients or their legal guardians provided HIPAA-compliant informed consent for participation and use of clinical data and photographs for publication purposes.

Participants

Three female patients with a diagnosis of idiopathic Bell's palsy were included in this case series, ranging in age from 7 months to 26 years at the time of presentation. Patients were eligible for inclusion if they had a confirmed diagnosis of facial palsy, were receiving physical therapy services under the care of the treating clinician and had pre- and post-intervention outcome data available. No patients were excluded based on age, chronicity of condition, or presence of comorbidities. Demographic and clinical characteristics at baseline are summarized in Table 1.

Table 1. Baseline Demographic and Clinical Characteristics of Participants.

Characteristic	Patient 1 (Adult)	Patient 2 (Child 1)	Patient 3 (Child 2)
Age at presentation	26 years	42 months	7 months
Sex	Female	Female	Female
Side affected	Left	Left	Left
Time since onset	5 years (chronic)	1 year	Acute at presentation
Baseline HB Grade	Grade V	Grade V	Grade IV
Primary concerns	Ptosis, facial asymmetry, epiphora, self-consciousness re: appearance and photographs, psychosocial impact	Feeding difficulties, tactile hypersensitivity, motor delays, balance	Feeding difficulties, poor weight gain, jaw tremor, poor latch
Prior intervention	None prior to this episode of care	Concurrent SLP and OT services	Surgical correction of tongue and lip tie (age 2 months); post-op stretching protocol
Hearing and vision	Within normal limits	Within normal limits	Within normal limits

Note. HB = House-Brackmann Facial Grading Scale. Grade IV = moderately severe dysfunction; Grade V = severe dysfunction. SLP = Speech-Language Pathology; OT = Occupational Therapy.

Patient 1 (Adult)

Patient 1 had received no prior facial rehabilitation interventions despite five years of chronic palsy. The patient reported feeling self-conscious about the appearance of her face and smile, especially noted in photographs. She also reported problematic epiphora, described as functionally disruptive in daily activities. These concerns contributed to self-reported social withdrawal and diminished quality of life.

Patient 2 (Child 1)

Patient 2 received concurrent speech-language pathology (SLP) and occupational therapy (OT) services at the time of referral. Clinical assessment revealed moderate tactile hypersensitivity of the mouth, hands, and feet; delayed eye-hand and eye-foot coordination relative to developmental age; decreased body awareness and poor balance, limiting functional mobility, transfers, and feeding. Oral-motor evaluation using the Beckman Oral Motor Assessment revealed poor upper and lower lip passive range of motion (PROM), retracted tongue, mandibular deviation to the left, poor left cheek range of motion, reduced jaw strength (left greater than right), and poor tongue lateralization. Caregivers reported that Patient 2 choked on loose food particles and could not tolerate bread-like textures.

Patient 3 (Child 2)

Patient 3 had a medical history significant for posterior tongue tie and upper lip tie, surgically corrected at 2 months of age, with post-operative stretching protocol. At presentation, the caregiver reported that Patient 3 would not accept a pacifier or bottle, demonstrated a poor latch during breastfeeding, and exhibited jaw tremors during feeds. She was in the 15th percentile for age, and concern about inadequate weight gain was expressed. She continued to wake every three to four hours overnight for feeds. The caregiver also reported gagging with puffed snacks and teething wafers, with episodes of choking on loose particles.

Outcome Measures

All three patients were assessed at baseline and at three-week follow-up using the House-Brackmann Facial Grading Scale (HBFGS), a six-point clinician-rated scale ranging from Grade I (normal function) to Grade VI (total paralysis) [15]. The HBFGS was selected for its established reliability and widespread use in both pediatric and adult populations with facial palsy. Patient 1 (Adult) additionally underwent assessment using the Sunnybrook Facial Grading System (SFGS) at baseline and follow-up, a composite scale that evaluates resting symmetry, voluntary movement, and synkinesis and provides greater sensitivity to change in adult patients than the HBFGS alone [16]. Standardized digital photographs were obtained at baseline and at the three-week follow-up for all three patients, capturing resting and dynamic facial symmetry. Caregiver and patient self-reports of functional changes, including feeding behavior, oral-motor tolerance, speech, and social participation, were documented at each weekly session.

Data Analysis

Given the small sample size inherent to a case series design (n = 3), inferential statistical testing was not appropriate. Descriptive statistics and effect sizes were calculated to characterize the magnitude of change in House-Brackmann grades over the intervention period and to inform power calculations for future controlled research. Cohen's d for paired observations was computed as the mean change score divided by the standard deviation of change scores [17]. For the Sunnybrook Facial Grading System, percentage improvement from baseline was calculated for Patient 1 only, as this measure was not administered to the pediatric patients.

Intervention

Sensory facial taping was selected as an adjunctive intervention based on its potential to deliver targeted proprioceptive input to the dermatomes innervated by the affected cranial nerves, thereby providing external sensory feedback to facilitate voluntary facial motor activation in the absence of sufficient intrinsic neuromuscular signaling. Taping was administered by the same licensed PT across all three cases using TNT: small, strategically placed elastic kinesiology tape applied with minimal tension (approximately 10%), consistent with [11], protocol for dermal stimulation. The work of Kristianto et al, Waluyo A, Yunir E, Gayatri D, Blow D. [18], validates the use of Neuromuscular Taping (NMT) using very light tensions in adhesive tape to provide space and cellular metabolism. The NMT technique uses decompression and compression stimuli to obtain beneficial effects on musculoskeletal, vascular, lymphatic and neurological systems to help the body return to homeostasis (2012). This approach is intended to activate mechanoreceptors in the dermal layer, including Ruffini corpuscles, Pacinian corpuscles, and Meissner's corpuscles, thereby providing proprioceptive feedback and facilitating neuromuscular re-education [10]. Taping protocols differed by patient. Patient 1 (Adult) received a dual protocol: bilateral neuromuscular taping along the mandible applied at night with small strips, and daytime TNT over the cutaneous exit sites of cranial nerves V (trigeminal) and VII (facial) on the affected side. Patient 2 (Child 1) and Patient 3 (Child 2) received bilateral daytime MTA over the CN V and VII exit sites on the affected side only; no nocturnal taping was applied in the pediatric cases.

Each taping application was worn for 3 days, after which caregivers were instructed to remove the tape from the top to the bottom. Three sequential taping applications were completed over a three-week period for each patient.

For Patient 2 (Child 1) and Patient 3 (Child 2), the treating PT conducted weekly one-hour sessions incorporating oral-motor work in conjunction with TNT application. Caregivers were present at all sessions and instructed in tape removal and monitoring procedures. Patient 1 (Adult) received no additional hands-on intervention beyond taping; she independently managed tape removal and home application between sessions. Tape tolerance, oral-motor progress, and skin response were reviewed verbally at each weekly contact for all patients. Figure 7 illustrates the MTA placement used across all three cases.

Results

All three patients completed the three-week sensory taping protocol without adverse effects, skin irritation, or early tape removal due to discomfort. Clinically meaningful improvements were observed across all patients in House-Brackmann scores, resting facial symmetry, and functional domains including feeding, oral-motor performance, and psychosocial participation. Outcomes are summarized in Table 2, followed by individual patient narratives and photographic documentation.

Mean House-Brackmann grade at baseline was 4.67 (range: 4–5), declining to 1.67 (range: 1–2) at three-week follow-up, representing a mean improvement of 3.00 grades (SD = 1.00; range: 2–4 grades). Per-patient percentage improvement in HB grade was 60.0% (Patient 1), 80.0% (Patient 2), and 50.0% (Patient 3), yielding a mean improvement of 63.3% across the case series. Effect size analysis yielded a Cohen's d of 3.00, indicating a very large treatment effect (Cohen, 1988). For Patient 1, the Sunnybrook Facial Grading System composite score improved from 55 to 96, a gain of 41 points representing a 74.5% improvement from baseline. Given the sample size of n = 3, these findings are descriptive and should be interpreted accordingly; they are reported to characterize the magnitude of the observed change and to inform power calculations for future controlled research.

Table 2. Summary of Outcomes Across All Patients.

Outcome Measure	Patient 1 (Adult)	Patient 2 (Child 1)	Patient 3 (Child 2)
Baseline HB Grade	Grade V	Grade V	Grade IV
Follow-up HB Grade	Grade II	Grade I	Grade II
HB Grade Change	−3 grades	−4 grades	−2 grades
Baseline Sunnybrook Score	55	N/A	N/A
Follow-up Sunnybrook Score	96	N/A	N/A
Sunnybrook Change	+41 points (74.5% improvement)	N/A	N/A
Facial symmetry	Improved smile symmetry; reduced asymmetry at rest	Improved resting symmetry; reduced mandibular deviation	Improved facial symmetry; reduced drooping
Ptosis	Resolved	Resolved; caregiver-reported improved facial symmetry	Resolved; caregiver-reported improved facial symmetry
Epiphora	Resolved	N/A	N/A
Feeding / oral-motor	No concerns at baseline or follow-up	Improved lip ROM, cheek ROM, tongue lateralization; improved texture tolerance	Improved latch; tolerating table food; reduced jaw tremor; improved weight gain
Psychosocial / participation	Improved self-image; greater comfort in photographs	Improved social interaction; caregiver reported satisfaction with facial symmetry in photographs; caregiver-reported functional gains in daily activities	Caregiver reported improved feeding confidence, facial symmetry in photographs, and social responsiveness
Adverse effects	None	None	None

Note. HB = House-Brackmann Facial Grading Scale (Grade I = normal; Grade VI = total paralysis). Sunnybrook Facial Grading System composite score range: 0–100 (higher scores indicate better function). N/A = not applicable. ROM = range of motion.

Patient 1 (Adult)

Patient 1 demonstrated substantial improvement across all outcome domains. Her House-Brackmann grade improved from Grade V at baseline to Grade II at follow-up, representing a three-grade improvement indicative of near-normal function with only slight weakness on close inspection. Her Sunnybrook Facial Grading System composite score improved from 55 at baseline to 96 at three-week follow-up, a gain of 41 points (74.5% improvement), reflecting marked gains in resting symmetry, voluntary movement, and reduction in synkinesis.

Functionally, she reported complete resolution of epiphora and improvement in ptosis on the affected side. Smile symmetry improved markedly, reporting feeling greater comfort with her facial appearance, including in photographs. She independently managed all home taping applications throughout the intervention period and reported no skin irritation or discomfort. Photographic documentation of four dynamic expressions at baseline and follow-up is presented in Figures 1–4.

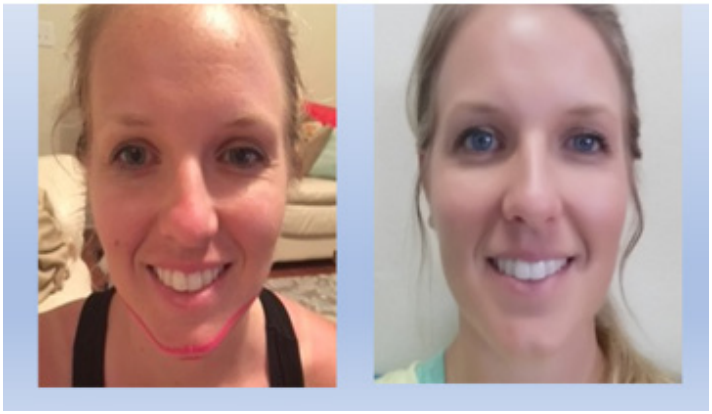

Figure 1. Patient 1 (Adult): Smiling expression at baseline (left) and three-week follow-up (right). Pink lines visible in baseline image represent bilateral mandibular night taping application. Note improvement in smile symmetry and reduction in facial asymmetry at follow-up.

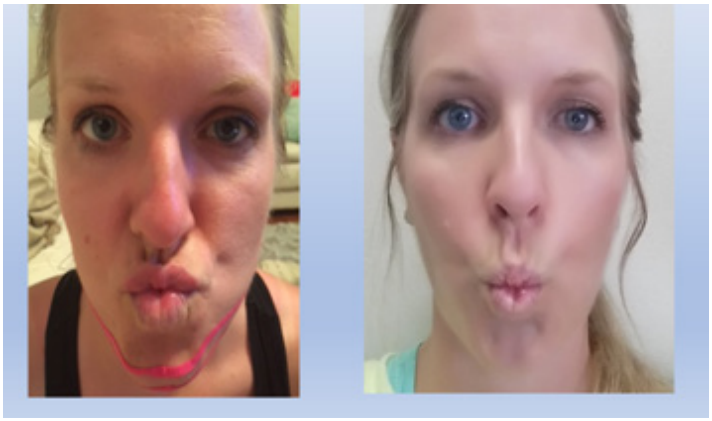

Figure 2. Patient 1 (Adult): Lip pucker at baseline (left) and three-week follow-up (right). Baseline image demonstrates asymmetric oral aperture and limited left-sided movement. Follow-up demonstrates markedly improved bilateral lip symmetry during volitional movement.

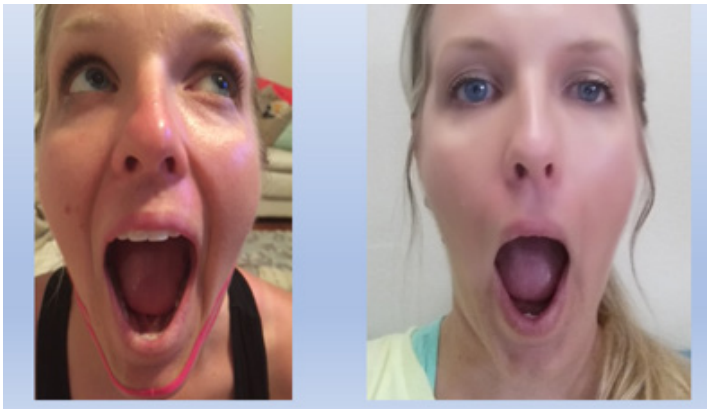

Figure 3. Patient 1 (Adult): Open mouth / jaw excursion at baseline (left) and three-week follow-up (right). Baseline image demonstrates deviation and asymmetry during maximal oral opening. Follow-up demonstrates improved midline alignment and more symmetric jaw excursion.

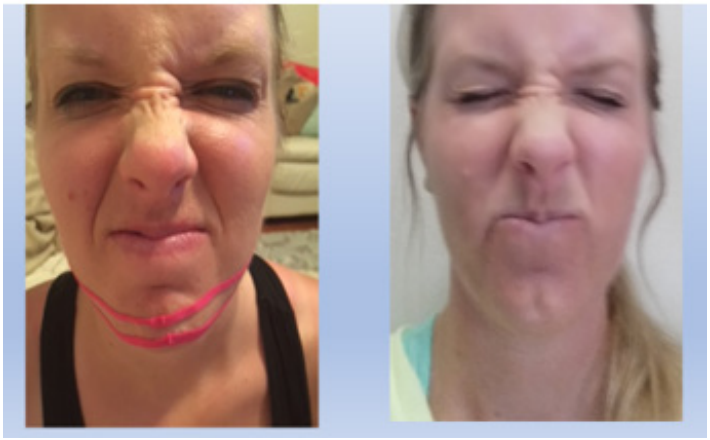

Figure 4. Patient 1 (Adult): Nose scrunch / voluntary eye closure at baseline (left) and three-week follow-up (right). Baseline image demonstrates incomplete eye closure and asymmetric nasal wrinkling on the affected side. Follow-up demonstrates improved symmetry of eye closure and nasal musculature activation.

Patient 2 (Child 1)

Patient 2 demonstrated meaningful improvement in facial motor function and oral-motor performance over the three-week intervention period. Her House-Brackmann grade improved from Grade V at baseline to Grade I at follow-up, a four-grade improvement representing a return to normal facial function. Ptosis on the affected side resolved over the course of the intervention, which was noted both clinically and by caregiver report. Weekly documentation reflected progressive gains in oral-motor function, with the treating PT noting improvements in passive range of motion of the upper and lower lips, left cheek, and tongue lateralization across the three sessions. Caregiver report indicated improved tolerance of varied food textures, fewer choking episodes, and greater acceptance of previously avoided textures. Resting facial symmetry improved, with reduced left mandibular deviation observed on clinical examination and in photographic comparison. Caregivers expressed satisfaction with the improvement in facial symmetry, reporting that Patient 2 looked symmet-

rical in photographs for the first time since the onset. No adverse effects or skin irritation were reported across any taping application. Photographic documentation is presented in Figure 5.

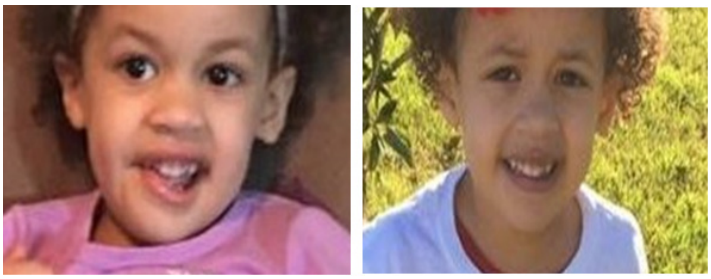

Figure 5. Patient 2 (Child 1, 42 months): Resting facial expression at baseline (left) and three-week follow-up (right). Note improvement in facial symmetry, reduced left-sided drooping, and increased bilateral activation of the smile musculature at follow-up.

Patient 3 (Child 2)

Patient 3 demonstrated clinically significant improvement in facial symmetry and feeding function following three weekly sensory applications. Her House-Brackmann grade improved from Grade IV at baseline to Grade II at follow-up, a two-grade improvement indicating near-normal facial function with only slight weakness. Ptosis on the affected side resolved over the course of the intervention, noted both on clinical examination and by caregiver report. Caregiver report documented notable gains in feeding behavior: improved latch, reduced jaw tremoring during feeds, and tolerance of table foods without choking, a behavior that had been a primary concern at intake. The caregiver report also indicated longer overnight sleep consolidation. Facial symmetry improved visibly, with reduced left-sided facial drooping and greater bilateral activation of the smile musculature observed in a photographic comparison. The caregiver expressed satisfaction with the improvement in facial symmetry, specifically noting that Patient 3 appeared symmetrical in photographs following the intervention. No skin irritation or adverse effects were reported. Photographic documentation is presented in Figure 6.

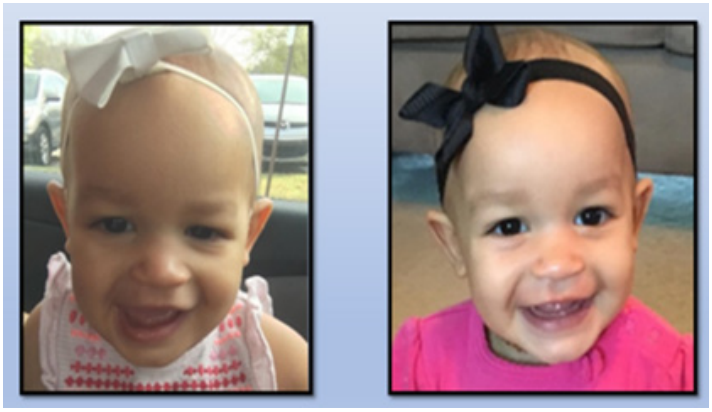

Figure 6. Patient 3 (Child 2, 7 months): Facial expression at baseline (left) and three-week follow-up (right). Note reduction in left-sided facial drooping and marked improvement in bilateral smile symmetry and spontaneous facial expression at follow-up.

Discussion

This retrospective case series describes the clinical use of sensory targeted neurosensory taping (TNT) as an adjunctive intervention for idiopathic Bell's palsy across the lifespan, including patients aged 7 months to 26 years. All three patients demonstrated clinically meaningful improvements in House-Brackmann grades, resting facial symmetry, and functional outcomes over a three-week period involving three sequential taping applications. These findings extend the emerging literature on facial taping as a rehabilitative adjunct [13,14,19], by including pediatric patients as young as 7 months, a population largely absent from existing taping research, and by demonstrating feasibility across a range of chronicity, from acute presentation to five-year chronic palsy.

Interpretation of Outcomes

The magnitude of improvement observed in this case series is noteworthy. Patient 1 (Adult) improved three House-Brackmann grades (Grade V to Grade II) and achieved a Sunnybrook Facial Grading System composite score of 96 out of 100 following three weeks of taping, a 74.5% improvement. This degree of change substantially exceeds the minimal clinically important difference reported for the Sunnybrook scale in adult facial palsy populations and is particularly remarkable given that Patient 1 had been living with chronic palsy for five years without prior rehabilitation. Prior studies have reported that kinesiology taping alone reduced House-Brackmann scores by approximately 39% in adult populations [19], and that biofeedback taping combined with exercise produced superior outcomes to exercise alone [14]. The gains observed in Patient 1, who received taping as her sole intervention, suggest that sensory taping applied with the TNT protocol may exert a meaningful independent therapeutic effect even in longstanding chronic palsy.

Patient 2 and Patient 3 each improved two House-Brackmann grades over the same three-week period. Patient 2 (Child 1, 42 months old) presented with significant comorbid sensorimotor challenges, including tactile hypersensitivity, global weakness, and complex oral-motor dysfunction, yet demonstrated improvements in lip range of motion, tongue lateralization, texture tolerance, and resting facial symmetry alongside her facial palsy outcomes. Patient 3 (Child 2, 7 months old) showed gains that extended beyond facial motor function to include improved feeding latch, resolution of jaw tremoring during feeds, tolerance of table foods, and improved overnight sleep consolidation. These broader functional gains in the pediatric patients suggest that the proprioceptive input provided by TNT may have system-level effects on neuromuscular organization that extend beyond the immediate site of application, consistent with established models of skin-based sensory integration [20.21].

Neuroplasticity and the Theoretical Basis for TNT

The outcomes observed across all three patients are consistent with the activity-dependent neuroplasticity framework advanced by [22], whose principles of "Use it and Improve it" provide a compelling theoretical basis for skin-mediated sensory rehabilitation. Kleim and Jones articulate that meaningful neurologic reorganization requires specificity, sufficient repetition, appropriate intensity, sustained timing, salience to the individual, and sensitivity to developmental age. The TNT protocol, as applied in this series, addresses each of these principles directly.

Specificity was achieved through targeted placement of tape over the cutaneous exit sites of CN V and VII, delivering focused proprioceptive input to the precise dermatomes associated with facial motor and sensory function. Repetition and timing were built into the protocol structure: each application remained in place for three to four days of continuous wear, providing sustained mechanoreceptor stimulation across waking and sleeping hours, repeated across three consecutive weeks. Intensity was calibrated through the minimal tension application (approximately 10%), consistent with the concept of a "minimal effective dose" of sensory input, sufficient to activate Ruffini corpuscles, Pacinian corpuscles, and Meissner's corpuscles without triggering sensory overload, particularly important in Patient 2's case given her documented tactile hypersensitivity [10,11]. Salience was high across all cases: for Patient 1, the intervention addressed a distressing chronic condition that had significantly affected her quality of life and social participation; for the pediatric patients, feeding and facial function

represented primary caregiving concerns with immediate daily relevance. Finally, developmental age is explicitly reflected in the case series design itself, which demonstrated that the TNT protocol was tolerated and effective across a range spanning infancy to adulthood — a finding consistent with Kleim and Jones' observation that younger neurological age at the time of intervention may enhance plasticity-driven recovery.

Taken together, the alignment between the TNT protocol and Kleim and Jones' neuroplasticity principles offers a mechanistic account of why relatively brief, low-intensity sensory input may produce clinically meaningful gains in facial motor function. Neural plasticity is defined as the "dynamic biological capacity of the central nervous system to undergo maturation, change structurally and functionally in response to experience" [23], and the present findings suggest that skin-based stimulation via TNT may be a viable vehicle for inducing such experience-dependent reorganization in both pediatric and adult facial palsy. [24], further described this mechanism in the context of pediatric rehabilitation, proposing that therapeutic touch delivered through elastic tape applications engages neuroplastic pathways in a manner consistent with activity-dependent cortical reorganization, supporting the theoretical basis for the TNT approach applied in this series.

Skin as a Therapeutic Interface

A central theoretical contribution of this case series is the framing of skin not merely as a passive substrate for tape application, but as an active sensory organ whose stimulation drives cortical and subcortical reorganization. As [20], described, skin represents the "entry level to the cortex" for systems governing perception, attention, and emotion. [21,25], have further elaborated the clinical implications of this understanding in the context of scar rehabilitation and dermatological healing, emphasizing that thoughtful engagement of the skin's sensory architecture can produce functional outcomes that extend well beyond the local tissue. Applied to facial palsy rehabilitation, this framework suggests that the therapeutic mechanism of TNT is not simply mechanical repositioning of soft tissue, but the recruitment of a richly innervated sensory system to drive top-down motor reorganization through the somatosensory and prefrontal cortex [7].

The resolution of epiphora in Patient 1 warrants specific attention in this context. Epiphora in Bell's palsy typically results from incomplete eye closure and disrupted lacrimal drainage secondary to orbicularis oculi weakness. Its resolution following taping, without any other intervention, suggests that the proprioceptive feedback provided by the TNT may have facilitated sufficient neuromuscular re-education of periorbital musculature to restore functional eye closure and lacrimal drainage, a mechanism consistent with the gate control and afferent stimulation effects described by [10,11]. Similarly, the resolution of ptosis across all three patients, spanning infant, preschool, and adult age groups, suggests a shared neuromuscular mechanism that responds to skin-based proprioceptive input, regardless of developmental stage.

Psychosocial and Participation Outcomes

A consistent and clinically meaningful finding across all three patients was improvement in psychosocial well-being and participation, particularly as reflected in caregiver and patient satisfaction with facial appearance in photographs. For Patient 1, this represented the resolution of a domain of significant distress: she had reported feeling self-conscious about her face and smile and had avoided photographs for five years prior to intervention. For pediatric patients, caregivers independently reported that their children appeared symmetrical in photographs for the first time since the onset, a milestone with significant emotional resonance for families navigating the social and developmental implications of visible facial differences in young children.

The testimony of Patient 3's caregiver captures this dimension with particular clarity:

"When my PT first told me about it, in my head I was thinking, 'how much could some tape really help?' Within a couple of weeks she went from nursing every 1–2 hours and no solids, to nursing every few hours and eating table food. The droopiness in her face went away and her face was more symmetrical."

This testimony reflects outcomes across two domains simultaneously: functional feeding gains and visible facial symmetry, both of which are meaningfully captured in the photographic documentation. It also illustrates the caregiver's initial skepticism and subsequent confidence in the intervention, which has direct implications for clinical implementation and patient education.

The caregiver of Patient 2 offered an equally striking account. Patient 2 presented with a clinical problem list that included left cheek retraction, balance deficits, limited oral intake, reduced chewing endurance, and gagging, challenges that had persisted despite approximately one year of prior intervention using chew tubes, oral stretches, and straw therapy. Her caregiver reported:

"When it came to talking, it was all out the side of her mouth. I was very skeptical that the tape would help. Therapists had tried for a year with chew tubes, stretches, and straws but nothing worked. Within 4–5 weeks of using tape the problem was almost completely resolved!"

This testimony is particularly significant in the context of prior treatment failure. The caregiver's report that one year of conventional oral-motor intervention produced no meaningful change, while three to four weeks of TNT application yielded near-complete resolution of speech and oral-motor deficits, raises important questions about the role of skin-based sensory input as a facilitating mechanism for gains that did not occur through direct oral-motor treatment alone. This is consistent with [22], salience principle: the tape may have introduced a novel, highly salient proprioceptive signal that the nervous system was primed to use in a way that repetitive tool-based therapies had not achieved. Taken together, both caregiver testimonies underscore the potential of the TNT protocol to effect change that is not only measurable on clinical scales but visible and meaningful to families in daily life. Psychosocial outcomes in facial palsy are well-documented as significant drivers of quality of life and long-term functional adaptation [5,6], yet they are rarely the primary endpoints of taping studies. The present findings suggest they warrant explicit inclusion in future outcome measurement frameworks.

Pediatric Considerations and Lifespan Applicability

A distinctive contribution of this case series is its inclusion of two pediatric patients, one of whom was 7 months of age at presentation, among the youngest reported in any facial taping study to date. Existing literature on facial palsy rehabilitation in children is sparse, and pharmacological options, such as corticosteroids, carry additional risks in pediatric populations [8,9]. The TNT protocol, applied with minimal tension and small strip dimensions consistent with [11], neonatal and pediatric taping guidelines, was tolerated without adverse effects in both pediatric patients across all three applications. Strong caregiver adherence was observed in both cases, facilitated by clear removal instructions (top-to-bottom, after 3 days) and weekly monitoring of the skin response.

The inclusion of a patient with significant comorbid sensorimotor challenges (Patient 2) further demonstrates the adaptability of the TNT approach. Despite moderate tactile hypersensitivity of the mouth, hands, and feet, a profile that might be expected to limit tolerance for any skin-applied intervention, Patient 2 demonstrated no adverse responses to taping

throughout the intervention period. This finding is consistent with [11], observation that low-tension elastic tape applications are generally well tolerated even in sensory-sensitive populations, and with [26, finding that patient discomfort, not age, was the primary predictor of reduced taping effectiveness in a pediatric cohort. The absence of discomfort in the present series is therefore clinically significant.

Comparison with Existing Literature

The present findings align with and extend several recent studies examining facial taping in palsy rehabilitation. [13], demonstrated in a randomized case-control study that facial taping as biofeedback, combined with physical rehabilitation, produced superior outcomes to rehabilitation alone in adult Bell's palsy patients. [14], similarly found that biofeedback taping with exercise outperformed exercise alone in reducing synkinesis severity. [19], reported a mean reduction in House-Brackmann score of 39.15% with kinesiology taping in adult neurological patients with CN VII palsy. The HB improvements observed in the present series, ranging from two to four grades across patients, are consistent with or exceed these reported effects, though direct comparison is limited by differences in patient age, chronicity, taping protocol, and the absence of a control condition in the present study.

Notably, the present series extends this literature in two important respects. First, it documents outcomes in pediatric patients as young as 7 months, a population not represented in any of the above studies. Second, it demonstrates meaningful gains in a patient with five-year chronic palsy who had received no prior rehabilitation, a profile that existing studies have largely excluded. The Sunnybrook score of 96 achieved by Patient 1 following three weeks of taping as a sole intervention is among the highest follow-up scores reported in the facial taping literature, and its achievement in a chronic case without adjunctive therapy is particularly notable.

Limitations

Several limitations of this case series must be acknowledged. As a retrospective, uncontrolled case series without a comparison group, causal attribution of outcomes to the TNT intervention is not possible. Spontaneous recovery, the natural disease trajectory, concurrent therapies received by pediatric patients (SLP and OT services), and regression to the mean may all have contributed to the observed improvements. The small sample size (n = 3) and heterogeneity across patients in age, chronicity, and comorbidity preclude generalization of findings. Outcome assessors were not blinded, and the House-Brackmann scale, while widely used, has known ceiling and floor effects that may not fully capture the nuances of change in pediatric facial function. The Sunnybrook scale was administered for Patient 1 only, limiting cross-patient comparability of the most sensitive outcome measure. Follow-up was limited to three weeks, and the durability of gains beyond this period was not assessed. Finally, the taping protocol, including strip dimensions, placement, tension, and wear duration, was not standardized against a published protocol and may vary in replication.

Future Directions

The findings of this case series support the need for controlled prospective studies examining the efficacy of sensory TNT protocols in facial palsy rehabilitation, with particular emphasis on pediatric populations and patients with chronic presentation. Future research should standardize taping protocols, include blinded outcome assessment, employ validated pediatric facial function measures, and incorporate longer follow-up periods to assess the durability of gains. Incorporating both the House-Brackmann and Sunnybrook scales across all patients would strengthen comparability of outcomes. Psychosocial outcomes, including validated measures of quality of life and caregiver burden, should be included as primary endpoints alongside motor function measures. Investigation of the neurophysiologic mechanisms underlying TNT-mediated recovery, including cortical reorganization and modulation of afferent pathways, using neuroimaging or electrophysiologic methods, would substantially advance the theoretical framework proposed in this series.

Conclusion

This retrospective case series provides preliminary evidence that sensory targeted neurosensory taping (TNT) represent a safe, feasible, and potentially effective adjunctive intervention for idiopathic Bell's palsy across the lifespan. All three patients, ranging in age from 7 months to 26 years, demonstrated clinically meaningful improvements in House-Brackmann grades, resting facial symmetry, and functional outcomes following three weeks of sensory taping, with no adverse effects reported. The adult patient also achieved a near-normal Sunnybrook Facial Grading System composite score of 96 after three weeks of taping as the sole intervention, representing a 74.5% improvement from baseline in a patient with a five-year history of chronic palsy who had received no prior rehabilitation.

Beyond quantitative outcome measures, caregiver testimonies across both pediatric cases documented meaningful functional gains, including resolution of speech lateralization, improved feeding latch and texture tolerance, reduced jaw tremoring, and improved sleep consolidation, that were not captured by the House-Brackmann scale alone. Notably, one caregiver described near-complete resolution of oral-motor deficits that had persisted despite one year of prior conventional intervention, within four to five weeks of MTA application. Across all three patients, caregivers and the adult patient reported satisfaction with improved facial symmetry in photographs, a psychosocial outcome that reflects the broader quality-of-life impact of visible facial palsy and the potential of this intervention to address it.

The theoretical framework supporting these outcomes integrates [22], neuroplasticity principles with an understanding of skin as an active sensory organ [20,21,25], proposing that low-tension, strategically placed TNT provide the specificity, repetition, intensity, timing, salience, and developmental sensitivity required to drive experience-dependent cortical reorganization in the facial motor system. [24], work on neuroplasticity via therapeutic touch further supports this framework in the pediatric rehabilitation context. The consistent findings across patients of markedly different ages, chronicity profiles, and comorbidity burden suggest that these mechanisms may operate broadly across the lifespan.

While these findings are promising, they must be interpreted within the limitations of a small, uncontrolled retrospective case series. Causal attribution to the TNT intervention cannot be established, and generalization of findings is not warranted at this stage. Controlled prospective studies with standardized protocols, blinded outcome assessment, validated pediatric measures, and longer follow-up periods are needed to rigorously evaluate the efficacy of sensory taping in facial palsy rehabilitation. This case series is offered as a contribution to the emerging evidence base for this approach and as a foundation for future investigation [27-29].

Conflict of Interest

The author declares no conflict of interest. The author has no affiliation, certification, or contractual relationship with any commercial taping organization. No commercial tape brand is endorsed in this study.

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