

Late Facial Nerve Decompression Surgery: Analysis of 20 Cases and A Brief Literature Review

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ABSTRACT

Objective: Late facial nerve decompression for Bell's Palsy, Ramsey Hunt Syndrome (RHS), and traumatic facial nerve paralysis (TFNP) secondary to temporal bone fracture remains a controversial subject when performed >2 weeks after the onset of symptoms. The purpose of this study was to review the current literature on this topic and compare and contrast those findings with the long-term results of delayed facial nerve decompression for facial paralysis at our institution.

Study Design: Retrospective case analysis and brief literature review.

Methods: Between 1992 and 2005 twenty patients with complete unilateral facial paralysis (Bell's=7, RHS=7, TFNP=6) underwent late (>2 weeks) facial nerve decompression (transmastoid, n=16, middle cranial fossa, n=4). Main outcomes measured were clinical indications for facial nerve decompression based available electrodiagnostic studies (n=3) and on the House-Brackmann (H-B) grading scale, timing of surgery, and post-operative facial function using the H-B grading scale. Exclusion criteria included those patients with < 1 year follow-up (n=2) and those with incomplete paralysis (Bell's; n=2, H-B grade 3/6 and 4/6) at clinical presentation that resulted in normal facial function (H-B grade 1/6) after late decompression.

Results: All patients had complete unilateral facial paralysis, and a H-B score of 6/6 upon presentation. Average follow-up was a minimum of 1 year (range 1-6 yr). The time between the onset of symptoms and surgical decompression ranged between 28-331 days (mean, 90). Following late facial nerve decompression, facial function improved to H-B I (n=1), HB II (n=4), and H-B III (n=2) in the Bell's Palsy cohort (mean, 2.1). Facial function was H-B II (n=3), and H-B III (n=4) in the RHS cohort (mean 2.6). And finally within the traumatic facial nerve paralysis group, facial function was H-B II (n=3), H-B III (n=2), and finally H-B V (n=1) (mean, 2.8). Average overall H-B score for all causes was 2.5. A total of three patients showed complete denervation by EMG studies (TFNP, n=2; RHS, n=1).
Conclusion: Despite current recommendations in the literature for early decompression of the facial nerve (< 2 weeks) when indicated, it is often difficult to see and assess patients within this time constraint. In these controversial cases of complete facial paralysis our clinical judgment utilizing late decompression resulted in good outcomes for 55% (n=11) of our patients (H-B grade I or II). We acknowledge the limitations of our study. This is a single center retrospective analysis of small numbers and the majority of patients did not receive electrodiagnostic studies to determine degeneration and/or regeneration of their facial nerve. Nonetheless in our limited experience, all patients benefited to some degree from facial nerve decompression, and those suffering from Bell's Palsy having the best overall improvement.

Introduction: Facial Nerve Paralysis

> Bell's Palsy- viral inflammation that induces edema within the facial nerve causing compression, ischemia, Wallerian degeneration and subsequent paralysis (Fig. 1, 2).¹

> Ramsay Hunt Syndrome- reactivation of latent varicella-zoster virus residing in the geniculate ganglion with subsequent inflammatory response involving the 5th cranial nerve resulting in paralysis.²

> Traumatic facial nerve paralysis- temporal bone fracture and/or stretching of nerve causes extensive edema within the fallopian canal resulting in a similar clinical outcome as mentioned above (Fig. 3).³

> Patients with facial paralysis have significant functional and social handicap.



Fig. 1. Right-sided facial Bell's Palsy- House-Brackmann grade 6.

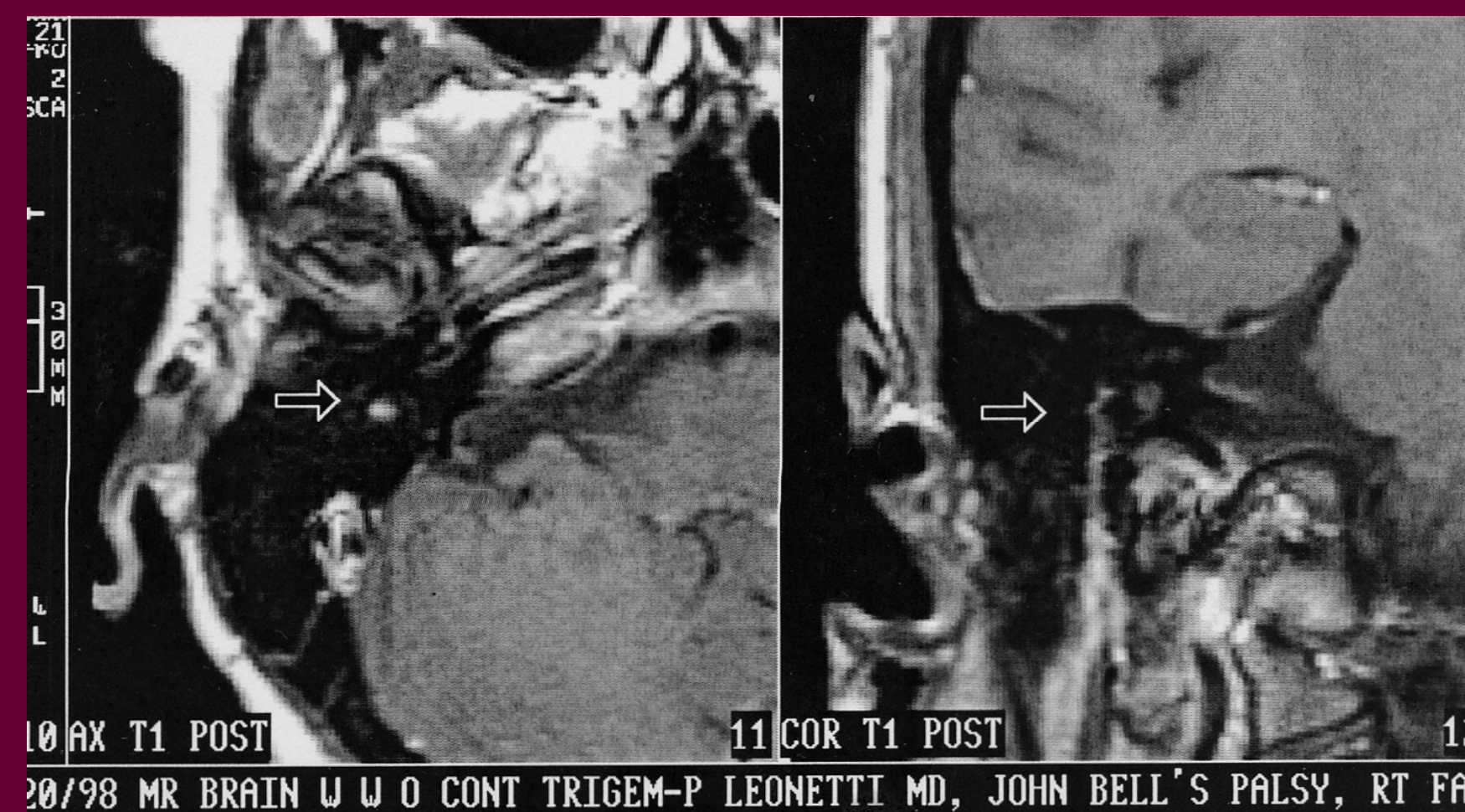


Fig. 2. MRI, post-gadolinium imaging demonstrating inflammatory changes and edema within the facial nerve.

Brief History of Facial Nerve Decompression and Indications

> 1908, Alt in Vienna was the first to decompress the facial nerve for cholesteatoma.⁴

> 1931, Duel was the first to decompress the facial nerve in Bell's Palsy.⁵

> 1968, Fisch popularized "bottle neck" concept of decompression; the critical area of narrowing at the entrance to the proximal end of the fallopian canal (Fig 4).⁶

> Fisch also introduced and popularized the use of ENOG in the management of Bell's palsy.

> 1999, Gantz et al, in a prospective study published guidelines in the surgical treatment of Bell's Palsy: ENOG > 90% degeneration, no EMG response, within 2 weeks of onset of total paralysis.⁷

> 2001, Quaranta et al, published good outcomes of late decompression for temporal bone fractures with 7/9 achieving H-B grade ≥ II with a mean time of decompression after injury of 49 days.⁸

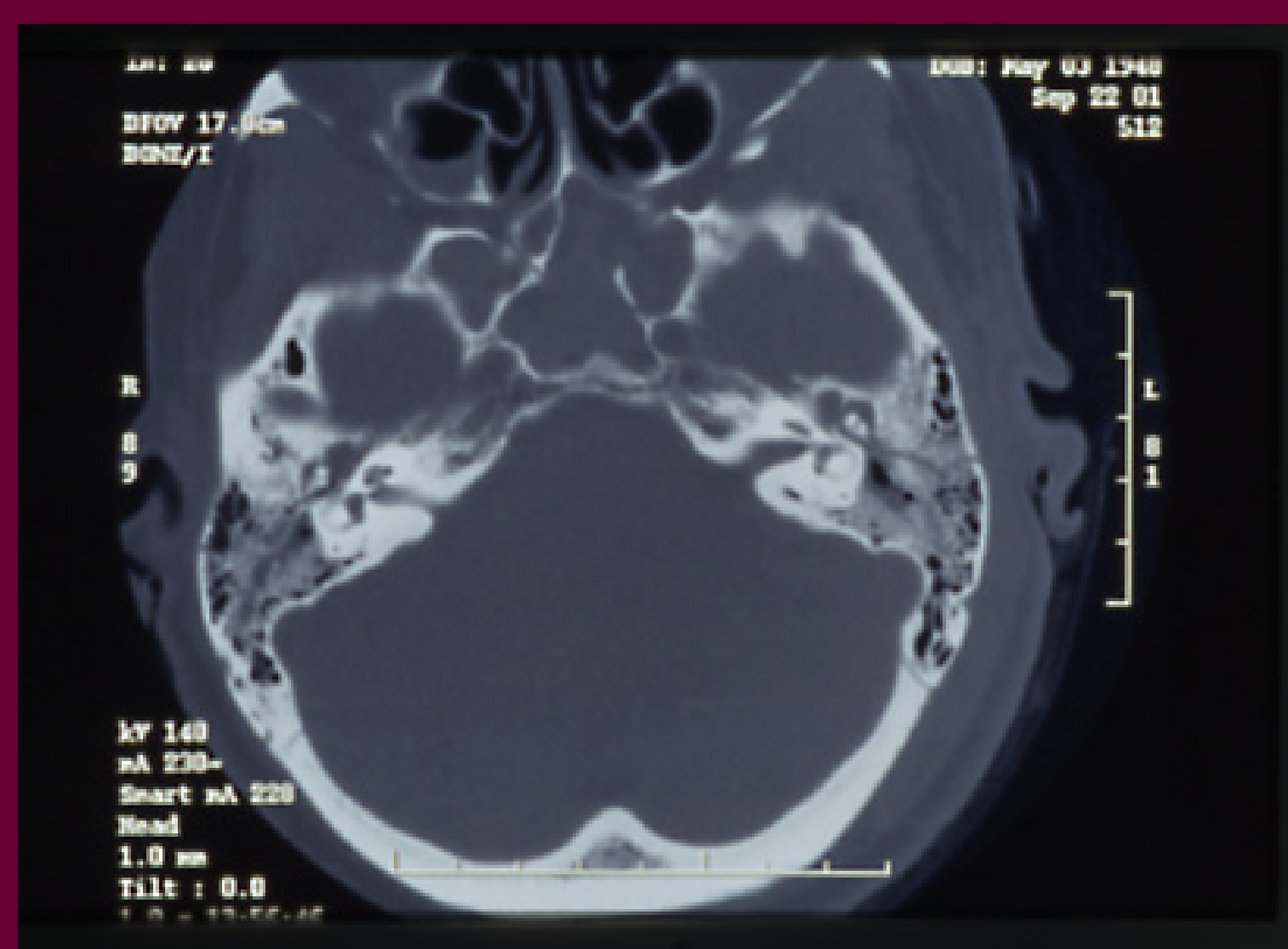


Fig. 3. CT scan demonstrating left transverse temporal bone fracture.

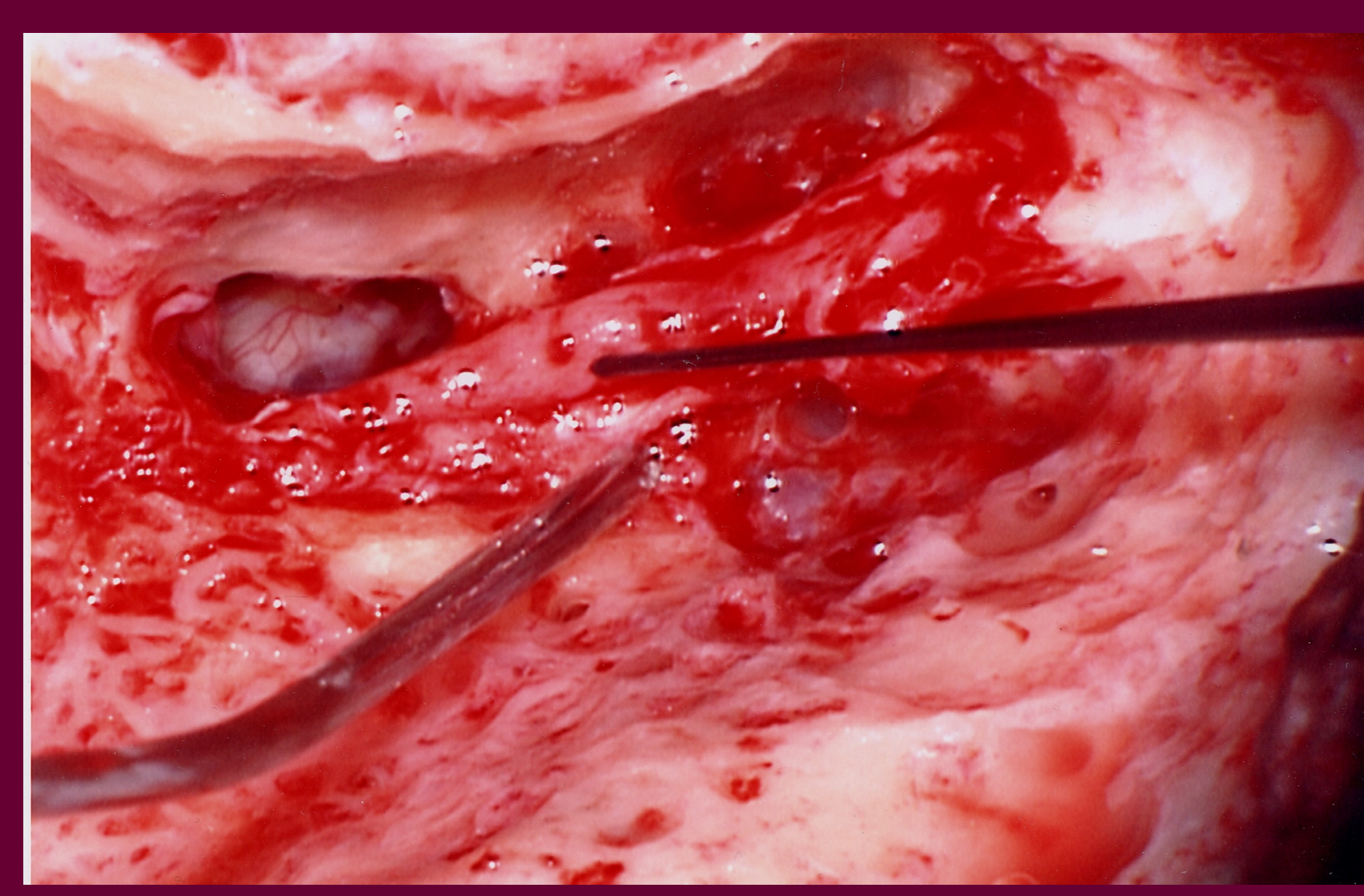


Fig. 4. Decompression and skeletonization of facial nerve.

Retrospective Study and Data Analysis

> Between 1992 and 2005, 20 patients underwent a late facial nerve decompression for complete unilateral facial paralysis (Table 1).

> Of the 20 patients, 6 patients had traumatic facial nerve paralysis secondary to temporal bone fracture, 7 due to Bell's Palsy, and finally 7 patients had Ramsay Hunt Syndrome.

> The majority, n=16, underwent a transmastoid approach to their decompression, with the rest, n=4, undergoing a middle cranial fossa approach with a mean time of decompression since injury of 90 days.

> 55% (n=11) had a H-B grade ≥ II and 40% (n=8) had H-B grade III.

> All patients enjoyed some improvement in facial function (mean H-B=2.5), and those suffering from Bell's Palsy having the greatest overall clinical improvement (mean H-B=2.) followed by the RHS cohort (mean, 2.6) and finally those with TFNP (mean 2.8, Fig. 5, 6).

Patient #	Age	Mechanism of paralysis	Operation type	Operation time (d)	Facial outcome (H-B score)
1	37 *	TFNP	MCF	118	2
2	12 *	TFNP	TM	85	5
3	50	TFNP	TM	87	3
4	26	TFNP	TM	104	2
5	19	TFNP	TM	32	2
6	15	TFNP	TM	185	3
7	40	Bell's	TM	68	2
8	44	Bell's	TM	57	1
9	64	Bell's	TM	97	3
10	47	Bell's	TM	44	2
11	39	Bell's	TM	42	2
12	45	Bell's	MCF	42	2
13	56	Bell's	MCF	28	3
14	63	RHS	TM	108	3
15	38	RHS	TM	62	2
16	39	RHS	TM	90	3
17	50	RHS	TM	40	3
18	43 *	RHS	TM	90	2
19	51	RHS	TM	331	3
20	50	RHS	MCF	88	2
Mean	44.4			89.9	2.5

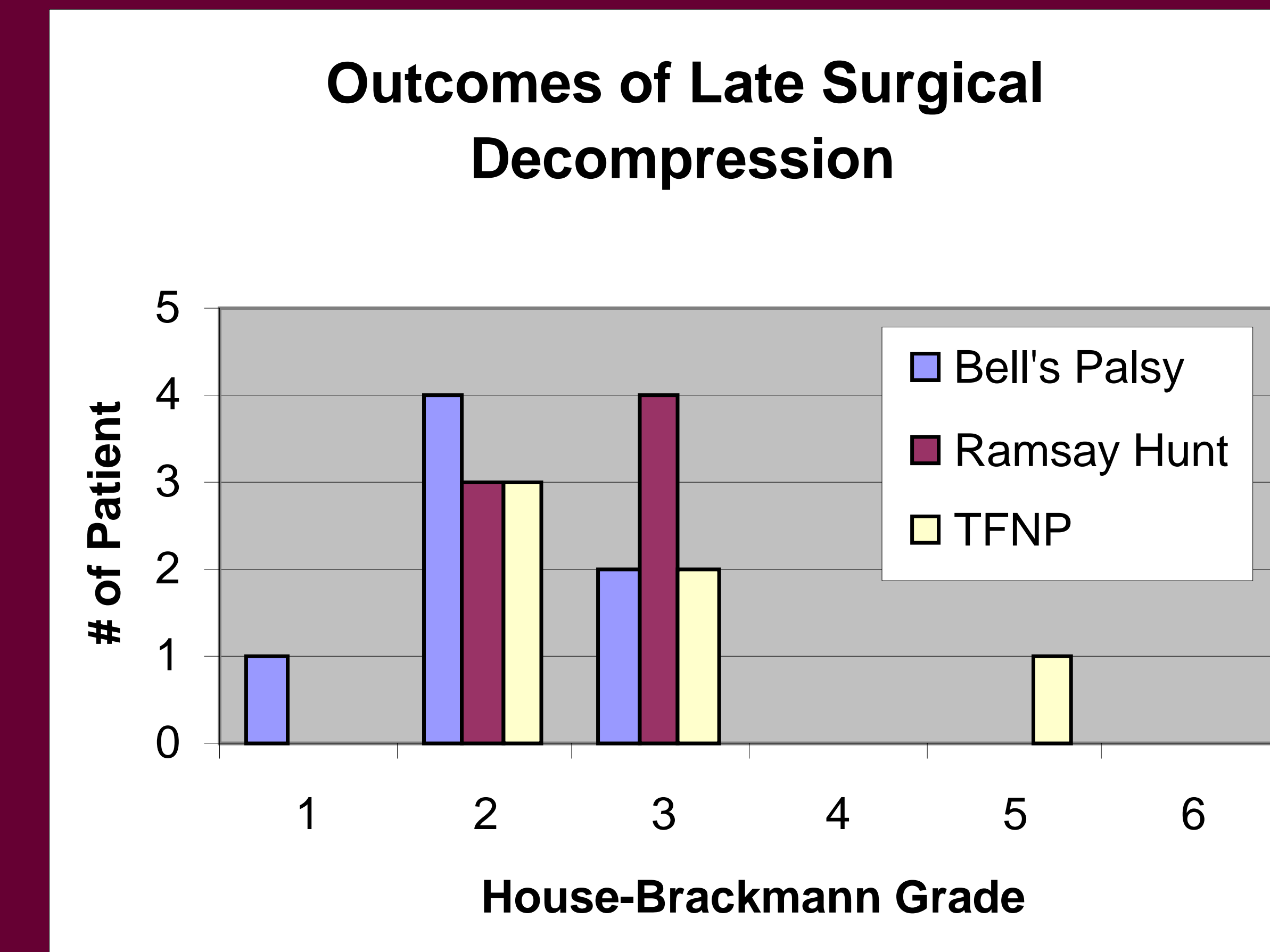


Fig. 5. Facial function outcomes per each mechanism of injury.

Table 1. Analysis of late facial nerve decompression

TFNP indicates traumatic facial paralysis; RHS, Ramsay Hunt Syndrome; MCF, middle cranial fossa; TM, transmastoid approach; H-B, House-Brackmann
* Indicates patients had complete denervation by EMG studies.



Fig. 6. (left) Right sided facial paralysis due to Bell's palsy; (right) Almost complete facial function following decompression.

Discussion and Conclusion

> Despite current recommendations in the literature for early decompression in patients who meet electrodiagnostic criteria, it is often difficult to see and assess patients within this time constraint.

> In these controversial cases with the majority of patients not undergoing electrodiagnostic studies, our clinical judgment based on a H-B grade of 6/6 upon presentation, late surgical decompression resulted in improvement in all our patients with the 95% having a H-B grade ≥ III.

> Noteworthy, one patient that underwent late decompression at 331 days post-TFNP resulted in a H-B grade III.

> This study demonstrates that unless there is a disruption of the main facial trunk, necessitating primary end-to-end anastomosis or grafting, the type of injury whether Bell's, RHS or TFNP may not have any clear effect on facial outcome, as long as appropriate surgical management is applied.

References

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