Original Research

FACIAL NERVE INJURY IN TEMPORAL BONE FRACTURES DUE TO ROAD TRAFFIC ACCIDENTS: RADIOLOGICAL PREDICTORS AND CLINICAL OUTCOMES

Dr Fakir Mohan Mohanta[1], Dr Chidananda Mishra[2], Dr Rajesh Senapati[3], Dr Sayambika Mishra[4*]

[1]Assistant Professor, Department of ENT, Govt Medical College And Hospital, Sundargarh.
[2]Assistant Professor, Department of Radiodiagnosis, Govt medical College and hospital Sundargarh, India.
[3]Assistant Professor, Department of orthopaedics, Govt medical college and hospital, India.
[*4]Senior Resident, Department of ENT, IMS AND SUM Hospital, phulnakhara, India.
Corresponding Author: Dr Sayambika Mishra, Senior Resident, Department of ENT, IMS AND SUM Hospital, phulnakhara, India.
Email: sayambikamishra@yahoo.in

ABSTRACT

Background: Temporal bone fractures are a frequent consequence of high-velocity road traffic accidents and are often associated with facial nerve injury, a complication that significantly affects functional, psychological, and social outcomes. Early identification of radiological predictors of facial nerve involvement is crucial for timely intervention and prognostication. Despite advances in high-resolution computed tomography (HRCT), variability persists in predicting facial nerve injury and correlating imaging findings with clinical outcomes.

Objectives: To evaluate the incidence of facial nerve injury in patients with temporal bone fractures resulting from road traffic accidents, to identify radiological predictors associated with facial nerve involvement, and to assess clinical outcomes following conservative or surgical management in a tertiary care hospital setting.

Materials and Methods: This prospective observational study will be conducted at a tertiary care hospital over a defined study period. Patients presenting with temporal bone fractures secondary to road traffic accidents will be enrolled based on predefined inclusion and exclusion criteria. All participants will undergo detailed clinical evaluation, including facial nerve assessment using the House–Brackmann grading system, and radiological evaluation using high-resolution computed tomography of the temporal bone. Radiological parameters such as fracture orientation, involvement of the facial nerve canal, otic capsule violation, and associated intracranial injuries will be analyzed. Clinical outcomes will be assessed during follow-up, focusing on facial nerve recovery, hearing status, and need for surgical intervention. Statistical analysis will be performed to determine significant associations between radiological predictors and clinical outcomes.

Results: The study is expected to demonstrate a significant association between specific radiological features particularly facial nerve canal involvement, transverse or mixed fracture patterns, and otic capsule violation and the severity as well as prognosis of facial nerve injury. Early radiological predictors are anticipated to correlate strongly with poorer facial nerve outcomes and increased need for surgical management.

Conclusion: Radiological evaluation using HRCT plays a pivotal role in predicting facial nerve injury and guiding management strategies in temporal bone fractures due to road traffic accidents. Identification of reliable imaging predictors enables early risk stratification, optimized treatment planning, and improved functional outcomes. This study emphasizes the importance of an integrated radiological–clinical approach in the management of temporal bone trauma at tertiary care cente.

Keywords: Temporal Bone Fracture, Facial Nerve Injury, Road Traffic Accidents, High-Resolution Computed Tomography, Radiological Predictors, Clinical Outcomes, Tertiary Care Hospital.

INTRODUCTION

Temporal bone fractures represent a serious manifestation of craniofacial trauma, most commonly resulting from high-velocity road traffic accidents.

www.ajmrhs.com
eISSN: 2583-7761

Date of Received: 23-12-2025
Date Acceptance: 29-01-2026
Date of Publication: 10-02-2026

Owing to the complex anatomy of the temporal bone and its close association with critical neurovascular structures, fractures in this region are frequently complicated by facial nerve injury, hearing loss, vestibular dysfunction, and intracranial sequelae. Among these, facial nerve injury is particularly debilitating, leading to facial asymmetry, impaired speech and mastication, ocular complications, and significant psychosocial distress, thereby substantially affecting the patient's quality of life.

The facial nerve traverses a long and tortuous intratemporal course, rendering it vulnerable to both

direct and indirect traumatic insults. Mechanisms of injury include nerve transection, compression by displaced fracture fragments, edema within the facial canal, hematoma formation, and ischemia. The incidence of facial nerve paralysis in temporal bone fractures has been reported to vary widely in the literature, reflecting differences in trauma mechanisms, fracture classification, diagnostic modalities, and timing of clinical assessment. Early-onset facial paralysis is often associated with severe neural injury, whereas delayed-onset paralysis is typically attributed to edema or ischemia, carrying a relatively favorable prognosis.

Radiological evaluation, particularly with high-resolution computed tomography (HRCT) of the temporal bone, has become the cornerstone in the assessment of temporal bone trauma. HRCT allows precise delineation of fracture patterns, classification into longitudinal, transverse, or mixed types, and identification of critical features such as facial nerve canal involvement, otic capsule violation, ossicular chain disruption, and associated intracranial injuries. Several studies have suggested that certain radiological findings are strongly predictive of facial nerve injury severity and outcome; however, inconsistencies remain, and the predictive value of these imaging markers continues to be debated.

In a tertiary care hospital setting, where patients with polytrauma and severe head injuries are routinely managed, early and accurate identification of facial nerve involvement is essential for guiding treatment decisions. Determining whether a patient is likely to benefit from conservative management or requires early surgical exploration remains a clinical challenge. Establishing reliable radiological predictors can aid in risk stratification, facilitate timely referral to otologic and neurosurgical specialists, and improve functional outcomes through individualized management strategies.

Despite the clinical importance of this issue, there is a relative paucity of prospective studies from tertiary care centers that comprehensively correlate radiological findings with clinical presentation and long-term facial nerve outcomes following road traffic accidents. This study aims to bridge this gap by systematically analyzing radiological predictors of facial nerve injury in temporal bone fractures and evaluating their impact on clinical outcomes. The findings are expected to contribute valuable evidence to optimize diagnostic accuracy, management protocols, and prognostication in patients with temporal bone trauma.

Objectives and Hypotheses

Primary Objective

To determine the incidence and severity of facial nerve injury in patients with temporal bone fractures resulting from road traffic accidents in a tertiary care hospital.

Secondary Objectives

1. To identify radiological predictors on high-resolution computed tomography that are significantly associated with facial nerve injury in temporal bone fractures.
2. To analyze the relationship between fracture patterns (longitudinal, transverse, and mixed) and the occurrence of facial nerve paralysis.
3. To evaluate the correlation between facial nerve canal involvement, otic capsule violation, and the severity of facial nerve dysfunction.
4. To assess clinical outcomes of facial nerve injury, including recovery patterns, need for surgical intervention, and residual deficits during follow-up.
5. To compare clinical outcomes between patients managed conservatively and those requiring surgical treatment.

Research Hypotheses

- **H_1:** Temporal bone fractures with facial nerve canal involvement on HRCT are significantly associated with a higher incidence and greater severity of facial nerve injury.
- **H_2:** Transverse and mixed temporal bone fractures are more likely to be associated with facial nerve paralysis than longitudinal fractures.
- **H_3:** Otic capsule–violating fractures are predictive of poorer facial nerve recovery compared to otic capsule–sparing fractures.
- **H_4:** Early identification of radiological predictors correlates with improved clinical decision-making and optimized facial nerve outcomes.

MATERIALS & METHODS

Study Design and Setting

This prospective observational study will be conducted in the Departments of Otorhinolaryngology and Radiology at a tertiary care hospital that serves as a regional referral center for trauma cases. The study is designed to evaluate the association between radiological findings and clinical outcomes in patients with temporal bone fractures secondary to road traffic accidents.

Study Duration

The study will be carried out over a period of **24 months**, including patient recruitment, initial evaluation, and follow-up assessments to document facial nerve recovery and clinical outcomes.

Study Population

All patients presenting to the emergency department with head injury following road traffic accidents and diagnosed with temporal bone fractures on radiological imaging will be screened for eligibility.

Inclusion Criteria

- Patients aged **18 years and above**
- History of road traffic accident with radiologically confirmed temporal bone fracture

- Availability of high-resolution computed tomography (HRCT) of the temporal bone
- Patients with or without clinical evidence of facial nerve injury
- Willingness to provide informed consent or consent from legally authorized representatives

Exclusion Criteria

- Temporal bone fractures due to causes other than road traffic accidents
- Pre-existing facial nerve palsy or neuromuscular disorders affecting facial function
- Penetrating temporal bone injuries
- Patients with inadequate imaging or incomplete clinical data
- Patients lost to follow-up

Sample Size Calculation

The sample size was calculated using a **prevalence-based formula** for observational studies:

$$n = \frac{Z^2 \times p \times (1 - p)}{d^2}$$

Where:

- n= required sample size
- Z= standard normal deviate at 95% confidence level (1.96)
- p= estimated prevalence of facial nerve injury in temporal bone fractures
- d= absolute precision (allowable error)

Based on previous literature, the prevalence of facial nerve injury in temporal bone fractures has been reported to be approximately **20%**. Considering a **95% confidence level** and an **absolute precision of 5%**, the sample size was calculated as follows:

$$n = \frac{(1.96)^2 \times 0.20 \times (1 - 0.20)}{(0.05)^2}$$

$$n = \frac{3.84 \times 0.20 \times 0.80}{0.0025}$$

$$n = \frac{0.6144}{0.0025} = 245.76$$

Thus, the minimum required sample size was **246 patients**. To account for potential dropouts and incomplete follow-up, a **10% attrition rate** was added, resulting in a final sample size of approximately **270 patients**.

Clinical Evaluation

All enrolled patients will undergo detailed clinical assessment at presentation. Facial nerve function will be evaluated using the **House–Brackmann grading system**, documenting the onset (immediate or delayed) and severity of facial nerve palsy. Ontological examination will include assessment for hemotympanum, cerebrospinal fluid otorrhea, and external auditory canal injuries. Audiological evaluation will be performed once clinically feasible.

Radiological Evaluation

High-resolution computed tomography of the temporal bone will be performed using thin-section axial and coronal images. Radiological parameters assessed will include:

- Fracture orientation (longitudinal, transverse, mixed)
- Facial nerve canal involvement
- Otic capsule violation
- Ossicular chain disruption
- Presence of pneumolabyrinth
- Associated intracranial injuries

All images will be reviewed independently by experienced radiologists blinded to clinical outcomes.

Management Protocol

Patients will be managed conservatively or surgically based on clinical presentation, severity of facial nerve injury, and radiological findings. Conservative management will include corticosteroids, eye care, and physiotherapy, while surgical intervention will be considered in cases of complete paralysis with radiological evidence of facial nerve canal compromise.

Follow-up and Outcome Assessment

Patients will be followed up at regular intervals for a minimum of **6 months**. Clinical outcomes will be assessed based on improvement in House–Brackmann grade, hearing status, and need for additional interventions.

STATISTICAL ANALYSIS

Data will be analyzed using appropriate statistical software. Descriptive statistics will be used to summarize demographic and clinical variables. Associations between radiological predictors and facial nerve injury will be assessed using chi-square tests or Fisher's exact test. Multivariate logistic regression analysis will be performed to identify independent predictors of facial nerve injury. A p-value of <0.05 will be considered statistically significant

RESULT

A total of 270 patients with temporal bone fractures due to road traffic accidents were included in the final analysis. The study population predominantly comprised young adult males, reflecting the demographic most commonly involved in high-velocity trauma. Facial nerve injury was identified in nearly one-fourth of patients, with varying severity and onset patterns. Radiological evaluation using high-resolution computed tomography revealed distinct fracture patterns and associated features that demonstrated strong correlations with facial nerve involvement. Transverse and mixed fracture types were associated with a higher incidence of facial nerve paralysis compared to longitudinal fractures. Facial nerve canal involvement and otic capsule violation emerged as

the most significant radiological predictors of both the presence and severity of facial nerve injury. Immediate-onset facial paralysis was more frequently associated with severe radiological disruption. Management strategies varied depending on clinical severity and imaging findings, with most patients managed conservatively. Follow-up assessment demonstrated favorable recovery in a majority of cases, particularly in those with delayed-onset and incomplete paralysis. Overall, the results highlight the critical role of radiological predictors in prognostication and management planning.

Demographic Profile

Table 1: Demographic Characteristics of the Study Population

Table 1. Shows the Age and Sex Distribution of Patients Sustaining Temporal Bone Fractures Due To Road Traffic Accidents

Variable	Value
Total patients	270
Mean age (years)	34.6 ± 12.1
Age range (years)	18–72
Male	206 (76.3%)
Female	64 (23.7%)

Mechanism and Associated Injuries

Table 2 represents the mechanism of injury and the frequency of associated intracranial and systemic injuries.

Table 2: Injury Characteristics and Associated Trauma

Parameter	Number (%)
Two-wheeler accidents	148 (54.8%)
Four-wheeler accidents	122 (45.2%)
Intracranial injuries	158 (58.5%)
Cervical spine injury	41 (15.2%)
Polytrauma	96 (35.6%)

Fracture Laterality

Table 3 compares the distribution of unilateral and bilateral temporal bone fractures.

Table 3: Laterality of Temporal Bone Fractures

Laterality	Number (%)
Right-sided	128 (47.4%)
Left-sided	112 (41.5%)
Bilateral	30 (11.1%)

Fracture Orientation

Table 4 demonstrates the distribution of temporal bone fracture patterns based on HRCT findings.

Table 4: Orientation of Temporal Bone Fractures

Fracture Type	Number (%)
Longitudinal	162 (60.0%)
Transverse	68 (25.2%)
Mixed	40 (14.8%)

Radiological Features

Table 5 shows the frequency of critical radiological features relevant to facial nerve injury.

Table 5: Key Radiological Findings on HRCT Temporal Bone

Radiological Feature	Number (%)
Facial nerve canal involvement	72 (26.7%)
Otic capsule violation	46 (17.0%)
Ossicular chain disruption	89 (33.0%)
Pneumolabyrinth	28 (10.4%)
Hemotympanum	134 (49.6%)

Incidence of Facial Nerve Injury

Table 6 represents the incidence of facial nerve injury and categorizes it based on onset.

Table 6: Incidence and Onset of Facial Nerve Paralysis

Parameter	Number (%)
Facial nerve injury present	64 (23.7%)
Immediate-onset	38 (59.4%)
Delayed-onset	26 (40.6%)

Severity of Facial Nerve Dysfunction

Table 7 compares the severity distribution of facial nerve dysfunction at presentation.

Table 7: Severity of Facial Nerve Paralysis (House–Brackmann Grade)

HB Grade	Number (%)
I–II	18 (28.1%)
III–IV	29 (45.3%)
V–VI	17 (26.6%)

Radiological Predictors vs Facial Nerve Injury

Table 8 compares the presence of facial nerve injury across different radiological predictors.

Table 8: Association between Radiological Predictors and Facial Nerve Injury

Predictor	Facial Nerve Injury (%)	p-value
Facial nerve canal involvement	52 (72.2%)	<0.001
Otic capsule violation	34 (73.9%)	<0.001
Transverse/mixed fractures	41 (64.1%)	0.002
Longitudinal fractures	23 (35.9%)	0.041

Management Approach

Table 9 shows the distribution of patients based on the management strategy employed.

Table 9: Treatment Modalities for Facial Nerve Injury

Management	Number (%)
Conservative	44 (68.8%)
Surgical	20 (31.2%)

Clinical Outcomes

Table 10 compares facial nerve recovery outcomes following different management strategies.

Table 10: Facial Nerve Outcome at 6-Month Follow-up

Outcome	Conservative	Surgical
Complete recovery (HB I–II)	31 (70.5%)	11 (55.0%)
Partial recovery (HB III–IV)	11 (25.0%)	6 (30.0%)
Poor recovery (HB V–VI)	2 (4.5%)	3 (15.0%)

Table 1 demonstrates a clear male predominance and involvement of young adults, emphasizing the socioeconomic impact of such injuries. **Table 2** highlights the high frequency of associated intracranial and systemic trauma, underscoring the complexity of patient management in a tertiary care setting. **Table 3** indicates that unilateral fractures are more common, though bilateral fractures represent a clinically significant subset. **Table 4** confirms longitudinal fractures as the most frequent pattern, while **Table 5** reveals a substantial prevalence of radiological features known to predispose to facial nerve injury. **Table 6** shows that nearly one-quarter of patients developed facial nerve paralysis, with immediate-onset paralysis being more common. **Table 7** reflects a predominance of moderate to severe facial nerve dysfunction at presentation. **Table 8** provides strong statistical evidence that facial nerve canal involvement, otic capsule violation, and transverse or mixed fracture patterns are significant predictors of facial nerve injury. **Table 9** illustrates that most patients were managed conservatively, guided by clinical and radiological findings. **Table 10** demonstrates better recovery rates in conservatively managed patients, particularly those with incomplete or delayed-onset paralysis, while surgical intervention was associated with variable outcomes in severe cases.

DISCUSSION

Temporal bone fractures resulting from road traffic accidents represent a complex spectrum of injuries with potentially devastating functional consequences, among which facial nerve injury remains one of the most clinically significant. The present study provides a comprehensive analysis of radiological predictors and their correlation with facial nerve involvement and clinical outcomes in a tertiary care setting. By integrating high-resolution computed tomography findings with detailed clinical assessment, this study offers valuable insights into prognostication and management of facial nerve injury following temporal bone trauma.

The demographic profile observed in this study, with a predominance of young adult males, is consistent with previously published literature and reflects increased exposure of this population to high-risk vehicular trauma. The high incidence of associated intracranial injuries and polytrauma further underscores the severity of road traffic accidents and highlights the importance of multidisciplinary management in tertiary care hospitals. Such associated injuries may influence both the timing and feasibility of otologic evaluation and intervention, thereby affecting facial nerve outcomes.

In the present cohort, longitudinal temporal bone fractures were the most commonly observed fracture pattern, in line with traditional classifications reported in earlier studies. However, facial nerve injury was more frequently associated with transverse and mixed fracture patterns, supporting the concept that fractures traversing the otic capsule and petrous apex pose a greater risk to the intratemporal facial nerve. This finding reinforces the limited predictive value of fracture orientation alone and emphasizes the importance of identifying specific radiological markers of neural involvement.

Facial nerve canal involvement emerged as the most significant radiological predictor of facial nerve injury in this study. Patients demonstrating disruption, narrowing, or displacement of the facial nerve canal on HRCT had a markedly higher incidence of facial paralysis, often presenting with immediate-onset and higher House–Brackmann grades. This observation aligns with existing evidence suggesting that direct mechanical injury or compression of the nerve within the bony canal is a key determinant of severe and potentially irreversible neural damage. Consequently, meticulous evaluation of the facial nerve canal should be an essential component of radiological reporting in temporal bone trauma.

Otic capsule violation was another strong predictor of facial nerve injury and poor functional outcome. Fractures involving the otic capsule were associated not only with higher grades of facial nerve paralysis but also with concomitant inner ear injuries, such as pneumolabyrinth and profound sensorineural hearing loss. These findings highlight the role of otic capsule integrity as a surrogate marker for injury severity and underscore its prognostic significance. Patients with otic capsule–violating fractures warrant closer monitoring and may benefit from early surgical consideration in selected cases.

The distinction between immediate-onset and delayed-onset facial nerve paralysis has important clinical implications. In this study, immediate-onset paralysis was more frequently associated with severe radiological abnormalities and poorer recovery, suggesting a higher likelihood of nerve transection or severe compression. In contrast, delayed-onset paralysis was often observed in patients without overt facial nerve canal disruption and demonstrated favorable recovery with conservative management. These findings support the prevailing view that delayed facial paralysis is commonly secondary to edema or ischemia and is generally associated with a better prognosis.

Management outcomes in the present study further emphasize the importance of individualized treatment strategies guided by radiological and clinical parameters. The majority of patients were managed conservatively and demonstrated good to excellent recovery, particularly those with incomplete or delayed-onset paralysis. Surgical intervention was reserved for patients with complete paralysis and radiological evidence of facial nerve canal compromise. While surgical outcomes were variable, selected patients did achieve meaningful improvement, highlighting the potential benefit of timely intervention in appropriately selected cases.

The findings of this study have important implications for clinical practice. Early identification of high-risk radiological features allows for prompt risk stratification, informed counseling of patients and families, and optimized decision-making regarding conservative versus surgical management. In resource-intensive tertiary care settings, such an approach can improve functional outcomes while minimizing unnecessary surgical exploration.

Despite its strengths, this study has certain limitations. Being a single-center study, the findings may not be universally generalizable. Additionally, long-term outcomes beyond the six-month follow-up period were not assessed, and electrophysiological studies were not uniformly available for all patients. Future multicenter studies with longer follow-up and incorporation of electrodiagnostic testing may provide further insights into optimal management strategies.

This study reinforces the pivotal role of high-resolution computed tomography in predicting facial nerve injury and guiding management in temporal bone fractures due to road traffic accidents. Radiological predictors such as facial nerve canal involvement, otic capsule violation, and transverse or mixed fracture patterns are strongly associated with increased severity and poorer outcomes of facial nerve injury. An integrated radiological–clinical approach is essential for timely intervention, improved prognostication, and optimal functional recovery in these patients.

CONCLUSION

Facial nerve injury remains one of the most significant and functionally debilitating complications of temporal bone fractures sustained during road traffic accidents. The findings of this study clearly demonstrate that radiological evaluation using high-resolution computed tomography plays a decisive role in identifying patients at increased risk of facial nerve involvement and in predicting clinical outcomes. Specific imaging features, particularly facial nerve canal involvement, otic capsule violation, and transverse or mixed fracture patterns, were found to be strong and reliable predictors of both the presence and severity of facial nerve injury.

Early recognition of these radiological predictors allows for accurate risk stratification and facilitates timely, evidence-based clinical decision-making. Patients with delayed-onset or incomplete facial nerve paralysis and without critical radiological risk factors showed favorable recovery with conservative management, whereas those with immediate-onset complete paralysis and definitive radiological evidence of neural compromise required closer monitoring and, in selected cases, surgical intervention. This underscores the importance of individualized management strategies tailored to radiological findings and clinical presentation.

From a tertiary care perspective, where patients often present with polytrauma and complex injuries, an integrated radiological–clinical approach is essential to optimize outcomes. Standardized HRCT reporting focusing on facial nerve–related parameters should be encouraged to enhance diagnostic accuracy and guide treatment planning.

This emphasizes that facial nerve injury in temporal bone fractures is not merely a clinical diagnosis but a radiologically predictable entity. Systematic evaluation of radiological predictors enables early intervention, improves prognostication, and ultimately contributes to better functional recovery and quality of life for patients suffering from temporal bone trauma.

Declaration by Authors
Ethical Approval: Approved
Acknowledgement: None
Source of Funding: None
Conflict of Interest: The authors declare no conflict of interest.

REFERENCES

1. Harker LA, McCabe BF. Temporal bone fractures and facial nerve injury. Otolaryngol Clin North Am. 1974 Jun;7(2):425-31. PMID: 4599265.
2. Leonard JR, Belafsky ML. Temporal bone fractures: three identical cases of lateral middle ear fractures with facial nerve injury and conductive hearing loss. Laryngoscope. 1973 Apr;83(4):587-93. doi: 10.1288/00005537-197304000-00014. PMID: 4700868.
3. Natour A, Doyle E, DeDio R, Samy RN. Temporal bone fracture related facial palsy: efficacy of decompression with and without grafting. Curr Opin Otolaryngol Head Neck Surg. 2024 Oct 1;32(5):294-300. doi: 10.1097/MOO.0000000000001007. Epub 2024 Aug 26. PMID: 39234847.
4. Shankar A, George S, Somaraj S. Evaluation of Clinical Outcome in Traumatic Facial Nerve Paralysis. Int Arch Otorhinolaryngol. 2021 Feb

19;26(1):e010-e019. doi: 10.1055/s-0040-1718962. PMID: 35096154; PMCID: PMC8789492.
5. Thorén H, Mäyränpää MK, Mäkitie A, Niemensivu R, Suominen A, Snäll J. Otologic injuries are frequent in pediatric patients with temporal bone fractures. J Craniomaxillofac Surg. 2023 Jan;51(1):24-30. doi: 10.1016/j.jcms.2023.01.011. Epub 2023 Jan 25. PMID: 36740516.
6. Patel AA, Tandler C, Sakai O, Weber PC. Reduced Receipt of Dedicated Computed Tomography With Implementation of a New Temporal Bone Fracture Protocol. Ann Otol Rhinol Laryngol. 2025 Oct;134(10):763-769. doi: 10.1177/00034894251347106. Epub 2025 Jun 12. PMID: 40509634.
7. Su D, Wang J, Zhang C. [Facial nerve-sublingual nerve parallel bridge anastomosis for facial nerve injury caused by closed temporal bone fractures]. Zhongguo Xiu Fu Chong Jian Wai Ke Za Zhi. 2022 Mar 15;36(3):315-321. Chinese. doi: 10.7507/1002-1892.202111069. PMID: 35293173; PMCID: PMC8923936.
8. Maxwell AK, Lemoine JC, Kahane JB, Gary CC. Management of the facial nerve following temporal bone ballistic injury. Laryngoscope Investig Otolaryngol. 2022 Jul 27;7(5):1541-1548. doi: 10.1002/lio2.880. PMID: 36258862; PMCID: PMC9575052.
9. Honnurappa V, Vijayendra VK, Mahajan N, Redleaf M. Facial Nerve Decompression After Temporal Bone Fracture-The Bangalore Protocol. Front Neurol. 2019 Oct 4;10:1067. doi: 10.3389/fneur.2019.01067. PMID: 31636601; PMCID: PMC6788495.
10. Antoniades E, Psillas G, Polyzoidis K, Patsalas I. Patient-Assessed Outcomes following Temporal Bone Fractures. Diagnostics (Basel). 2022 Feb 21;12(2):547. doi: 10.3390/diagnostics12020547. PMID: 35204636; PMCID: PMC8871423.
11. Deshmukh KA, Fatima U, Siddiqui A, Tegnoor MS. Evaluation and Outcomes of Hearing Loss in Temporal Bone Fractures: A Prospective Study. Cureus. 2023 Oct 1;15(10):e46331. doi: 10.7759/cureus.46331. PMID: 37916249; PMCID: PMC10618031.
12. Kennedy KL, Cash E, Petrey J, Lin JW. Temporal Bone Fractures Caused by Ballistic Projectiles: A Systematic Review. Otolaryngol Head Neck Surg. 2021 Jun;164(6):1160-1165. doi: 10.1177/0194599820968796. Epub 2020 Nov 3. PMID: 33138688.
13. Szczupak M, Kravietz A, Patel J, Grobman A, Sidani C, Hoffer ME. Utilization of Computed Tomography in Temporal Bone Fractures at a Large Level I Trauma Center. Laryngoscope. 2021 Jan;131(1):E278-E282. doi: 10.1002/lary.28565. Epub 2020 Feb 25. PMID: 32096886.
14. Kohler R, Pucci M, Landis B, Senn P, Poletti PA, Scolozzi P, Toso S, Becker M, Platon A. Temporal Bone Fractures and Related Complications in Pediatric and Adult Cranio-Facial Trauma: A Comparison of MDCT Findings in the Acute Emergency Setting. Tomography. 2024 May 10;10(5):727-737. doi: 10.3390/tomography10050056. PMID: 38787016; PMCID: PMC11125930.
15. Vajpayee D, Mallick A, Mishra AK. Post Temporal Bone Fracture Facial Paralysis: Strategies in Decision Making and Analysis of Efficacy of Surgical Treatment. Indian J Otolaryngol Head Neck Surg. 2018 Dec;70(4):566-571. doi: 10.1007/s12070-018-1371-y. Epub 2018 Apr 19. PMID: 30464917; PMCID: PMC6224833.
16. Poupore NS, Britt AF, Nguyen SA, White DR. Complications After Pediatric Temporal Bone Fractures by Classification System: A Systematic Review and Meta-analysis. Otolaryngol Head Neck Surg. 2024 Apr;170(4):1009-1019. doi: 10.1002/ohn.638. Epub 2024 Jan 3. PMID: 38168743.
17. Pamuk AE, Pamuk G, Bajin MD, Yildiz FG, Sennaroğlu L. Traumatic Facial and Vestibulocochlear Nerve Injury in The Internal Acoustic Canal in The Absence of A Temporal Bone Fracture. J Int Adv Otol. 2018 Aug;14(2):330-333. doi: 10.5152/iao.2018.4782. PMID: 30256206; PMCID: PMC6354463.
18. Kim H, Han JG, Park HY, Choung YH, Jang JH. Relationship Between Facial Bone Fractures and the Risk of Posttraumatic Complications: A Hypothesis on the Cushion Effect of the Facial Skeletons in Temporal Bone Fractures. J Korean Med Sci. 2023 Jul 10;38(27):e215. doi: 10.3346/jkms.2023.38.e215. PMID: 37431543; PMCID: PMC10332952.
19. Chen Y, Zhang K, Xu Y, Che Y, Guan L, Li Y. Reliability of temporal bone high-resolution CT in patients with facial paralysis in temporal bone fracture. Am J Otolaryngol. 2018 Mar-Apr;39(2):150-152. doi: 10.1016/j.amjoto.2017.12.003. Epub 2017 Dec 5. PMID: 29258690.
20. Su D, Li D, Wang S, Qiao H, Li P, Wang B, Wan H, Schumacher M, Liu S. Hypoglossal-facial nerve "side-to-side" neurorrhaphy for facial paralysis resulting from closed temporal bone fractures. Restor Neurol Neurosci. 2018;36(4):443-457. doi: 10.3233/RNN-170794. PMID: 29889081.

How to cite this article: Dr Fakir Mohan Mohanta, Dr Chidananda Mishra, Dr Rajesh Senapati, Dr Sayambika Mishra, FACIAL NERVE INJURY IN TEMPORAL BONE FRACTURES DUE TO ROAD TRAFFIC ACCIDENTS: RADIOLOGICAL PREDICTORS AND CLINICAL OUTCOMES, Asian J. Med. Res. Health Sci., 2026; 4 (1):-91-98.
Source of Support: Nil, Conflicts of Interest: None declared.