

Rehabilitation management of brachial plexus avulsion following severe road traffic trauma-case report

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INTRODUCTION

- Brachial plexus avulsion represents one of the most severe injuries of the peripheral nervous system, most commonly occurring in the context of high-energy trauma, particularly road traffic accidents.
- It results in major functional impairment of the upper limb, characterized by flaccid paralysis, loss of sensation, and significant limitations in functional independence, with a profound impact on the patient's quality of life.

CASE PRESENTATION

- Male, 48 years old, was admitted on 19.01.2026
- Medical history includes sequelae following a severe motor vehicle accident on July 5, 2025 resulting in C8-T1 avulsion, a C5-C7 brachial plexus injury, right femoral and tibiofibular fractures, surgically treated with internal metal fixation
- The patient presents functional impairment and neuropathic pain in the right upper limb
- No other known comorbidities. The patient denies tobacco or alcohol consumption.

Clinical Examination

Mental status: conscious, cooperative, oriented

-  Complete paralysis (plegia) of the right upper limb
-  Marked atrophy of the scapular girdle and right upper limb
-  Absent reflexes in the right upper limb
-  Sensory disturbances in the distal portion
-  **Neuropathic pain:** frequent, intense

SCALES AND ASSESSMENTS

Functional assessment was performed using FIM, MRC, DASH and VAS scales, highlighting severe upper limb impairment with significant impact on overall independence.

- The patient presented a FIM score of 90/126, indicating a moderate level of functional dependence

 **MRC (Medical Research Council)**

0/5 distal, 1/5 proximal

● Right upper limb

Severe motor deficit

● Distal (hand)

0/5 - Complete paralysis

● Proximal (arm)

1/5 - Minimal contraction

SCALES AND ASSESSMENTS



DASH (Disabilities of Arm, Shoulder, Hand)

96 / 100

● DASH Score

96 - Almost complete functional impairment



● Severe disability



VAS (Visual Analog Scale)

8 / 10

● Pain intensity

Severe pain



● High pain level

LABORATORY AND IMAGING INVESTIGATIONS



MRI Results

 Severe

- **Severe post-traumatic brachial plexopathy**
Complex brachial plexus lesion with significant structural changes
- **C8-T1 root avulsion**
Preganglionic lesion without potential for spontaneous recovery
- **T2/STIR hyperintensity**
Diffuse signal changes - residual/secular axonal lesion
- **Active denervation**
Marked muscle atrophy - chronic loss of motor innervation

LABORATORY AND IMAGING INVESTIGATIONS

Clinico-Biological Correlations: Laboratory investigations reveal a biological inflammatory syndrome and a post-traumatic hematologic profile: ESR (80 mm/h): Significantly elevated value, indicating a persistent or reactive systemic inflammatory process. **Hematologic Profile:** Presence of secondary anemia (Hb 10.8 g/dL, Hct 33.1%, RBC 3.72 mln/ μ L), commonly encountered in the context of major polytrauma or chronic inflammation (anemia of chronic disease). Mild thrombocytosis (421,000/ μ L): An acute-phase reaction, correlated with the inflammatory status and the patient's surgical/traumatic history.

TREATMENT

1. Individual Hydrokinesitherapy (Techirghiol Saline Water)
2. Advanced Electrotherapy and Neuromodulation
 - Galvanic Stimulation (Right Palm):
 - CARE Therapy (TECAR)
 - Bioness 200 (Functional Electrical Stimulation - FES)
 - SRT 5 System



TREATMENT

3. Manual Therapy and Kinesitherapy

- Trophic Massage (Cervico-thoraco-lumbar, shoulder girdle, and upper limb)
- Kinesitherapy: Passive and Passive-Active Range of Motion Exercises



DISCHARGE SCALES

Parameter	Admission	Discharge	Interpretation
DASH	~96	~90	Severe upper limb disability persists
FIM	~90	~95	Improved functional independence
VAS (pain)	8	5	Moderate pain reduction
MRC (upper limb)	0 distal / 1 proximal	0 distal / 1 proximal	No motor recovery

Conclusion

Severe brachial plexus avulsion leads to minimal chances of neurological recovery. However, rehabilitation remains essential.

While the hand remains non-functional, the patient becomes more independent.



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