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Case Report

# Post-traumatic cervical anterolisthesis: Comprehensive evaluation and expert opinion based on clinical reasoning and clinical judgment skills

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**الملخص**

تعرض هذه الحالة بالتفصيل لموظف ذكر عمره ٣١ عاما يعاني من آلام على نطاق واسع ومعاناة حدت بشكل كبير من عمله اليومي. تلقى المريض بعض جلسات العلاج الطبيعي ولكن لسوء الحظ كانت النتائج سيئة وغير مرضية. تم استدعاء خبير في هذا المجال ذي خبرة متميزة للتقييم باستخدام أسلوب منهجي جديد. أجري تقييم شامل للجسم باستخدام التقييم الشامل-إعادة التقييم والتقييم باستخدام أسلوب علم الحركة الحيوي. هذا الأسلوب مخصص لتوجيه المتخصصين في العلاج الطبيعي وإعادة التأهيل لإجراء التقييم الشامل خصوصا للحالات العصبية العضلية الهيكلية المعقدة. استخدم الخبير أسلوب الوقوف على مدى انتشار الأعراض المستعصية. الأسلوب المنهجي يوفر بالإضافة إلى التقييم الشامل إرشادا للمعالجين حديثي الخبرة في تنفيذ تداخلات العلاج الطبيعي. تؤكد الدراسة أن الحالات المستعصية تحتاج إلى تقييم بدقة باستخدام الأسلوب المنهجي من قبل المعالجين المدربين تدريبا عاليا.

**الكلمات المفتاحية:** التقييم؛ الرأي الإكلينيكي؛ البرهان الإكلينيكي؛ رأي الخبير

**Abstract**

This case report details the case of a 31-year-old male clerk who complained of widespread pain that significantly limited his daily work. The patient underwent some physical therapy sessions, but unfortunately, the results were unsatisfactory. An expert in the field with distinguished experience was called to evaluate the patient using a new systematic approach. Comprehensive whole body evaluation was conducted using a total assessment-reassessment & evaluation using bio-kinesiologic (TAREK) approach. This approach is aimed at guiding physical therapists and rehabilitation professionals in conducting comprehensive evaluations, particularly for complex neuromusculoskeletal cases. The expert used the TAREK approach to address the patient; persistent symptoms. The systematic approach not only enables comprehensive evaluation but also guides junior therapists in implementing physical therapy interventions. The study suggests that complex neuromusculoskeletal cases need to be thoroughly evaluated by highly trained therapists using the systematic approach.

**Keywords:** Assessment; Clinical judgment; Clinical reasoning; Expert opinion



## Introduction

Motor vehicle accidents (MVAs) in the KSA constitute one of the major causes of morbidity and mortality. MVAs cost about 21 billion Saudi riyals annually, with about 21 deaths daily.[1,2] The Red Crescent recorded about 526,000 accidents annually. The government loses a huge amount of money from deaths, property damage, medical care, and loss of working hours. Major MVAs are classified as microtraumas, which result in multiple injuries. Statistical reports have indicated that almost 46,000 Saudi citizens had died during the past year.[1] Mansuri et al.[3] reported that road traffic accidents is a huge burden on the healthcare system and accounts for almost 83% of all trauma admissions. Young men are the most affected victims of road traffic accidents.[4] Patients who sustain macrotraumas, such as in MVAs, are more likely to receive physical therapy

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and rehabilitation for the rest of their lives. Rehabilitation becomes fundamental to not only improve their functional capabilities but also maintain functional mobility. Given the complexity of the cases, clinical reasoning and clinical judgment skills become fundamental.[5–7] However, there is no theoretical framework to guide clinicians in extracting pertinent clinical findings in a step-by-step manner, especially in complex cases that do not show satisfactory response to rehabilitation. The objective of this case report is to provide clinicians with a new systematic approach to underpin the reasons behind the persistent symptoms. It is hypothesized that the total assessment-reassessment & evaluation using biokinesiologic (TAREK) approach is comprehensive, feasible, and systematic to guide for clinicians to address the spread of persistent symptoms in complicated, poorly responding cases.

## Case report

The study subject was a 3-year-old right-hand-dominant male clerk who reported to a physical therapy outpatient clinic for evaluation. The patient was evaluated by the orthopedic physical therapy consultant. The patient stated that he had a major car accident 4 years ago. The patient was not wearing a seatbelt and lost his consciousness at the time of the accident. He was taken to the emergency unit by the ambulance where he was evaluated by a trauma consultant who ordered magnetic resonance imaging and admission. He stayed for four days at the hospital and was discharged to follow up and start physical therapy and rehabilitation. The patient added that he is always seeking physical therapy when symptoms aggravate, but unfortunately, the results seem to be poor and unsatisfactory. He indicated that his neck pain is his chief complaint. Pain is 3–4/10 at the time of evaluation which goes up to 8/10 at worst and goes down to 2/10 at best. He added that he feels that his case is unchanging. The patient indicated that his neck pain is the kind of dull ache that shoots down from the left arm to the level of the left elbow. He reported some numbness and heaviness of the left arm and indicated that elevating his arm increased the pain, while resting the arm on a support eased the pain. The patient had to take pain medications most of time and sometimes used hot packs as he had started to develop some allergy to pain medications. He had become very cautious when playing with his kids and stopped going to the gym since his car accident. He added that his neck-arm pain is limiting his ability to look over the shoulders during driving his car and he is moving his neck slowly and cautiously. He has limited end range of all neck movements especially neck extension during looking at the ceiling. Shoulder flexion is 160/180 on the right side and 155/180 on the left side. Shoulder abduction and rotations are slightly limited but of poor quality. Composite upper limb functional movements are within functional limits. The patient had no significant past, social, or family history, comorbidities, or lab findings. Radiologic findings include anterolisthesis of C4 with narrowing of the left-side neural foramina of C4–5 and unilateral left facet subluxation of C4–5 with subtle fracture of C5 vertebra. Passive physiologic movements are more than active physiologic movements for all neck and shoulder movements. The patient has limited and painful passive accessory anteroposterior humeral head gliding. Trunk forward bending test is limited to 10 cm from the fingertip to the floor, but all other trunk movements are within functional limits. The patient was observed to sit slouched with forward head-neck posture. Manual muscle test of the upper and lower extremities is within functional limits. The patient has significant difficulties in balancing on one leg, with the left side more than right side, especially with the eyes closed. Observational gait analysis showed no apparent deficits. The patient has positive neck quadrant on the left side which aggravates when applying compression on the neck at that position. He has paresthesia at the left little and ring fingers. Crank test is questionable when applied to the left shoulder. O'Brien test is positive on the left shoulder. No red or yellow flags were detected. Ethical approval (approval no. CMR-PT-2017-005) was obtained from the College of Medical Rehabilitation, Taibah University, which operates according to the Declaration of Helsinki. The expert came out with four physical therapy diagnoses that should guide junior therapists in implementing physical therapy interventions. The following diagnoses were listed: 1) post-traumatic neck and left shoulder derangement, 2) painful end-range stiffness of all neck movements particularly neck extension, 3) subtle left shoulder pathomechanics, and 4) left arm radiculopathy with left little finger and ring finger paresthesia.

## Discussion

The injuries at multiple body regions necessitate lifelong rehabilitation of the chronic illness. Inexperienced therapists and rehabilitation professionals are always having difficulties in probing the sources of the suffering of complicated patients. This case study is complicated due to multiple injuries particularly in the cervical spine with a history of loss of consciousness. Lisanti and Hartness[8] are in agreement with the complexity of management of post-traumatic cervical spondylolisthesis especially when there is some degree of instability. Freedman et al.[9] confirmed the difficulties associated with assessment of the cervical spine in complicated patients because of the potential of devastating neurologic complications from any missed cervical injury. Niere and Torney[10] reported that a history of major trauma is one of the main factors in considering the possibility of some degrees of cervical instability that needs qualified rehabilitation professionals with specific clinical skills. An expert in the field with distinguished clinical skills and over than 25 years of experience was invited to share his clinical experience. The expert is a certified orthopedic clinical specialist by the American Board of Medical Specialties. He is also certified by McKenzie Institute of North America and a certified ergonomic specialist and Doctor of Philosophy holder. The expert used the TAREK approach to address the spread of stubborn symptoms. It is good to acknowledge that the TAREK approach was originally discussed by Dr. Tarek El-gohary as shown in Figure 1. The TAREK approach is dedicated to guiding physical therapists and rehabilitation professionals in conducting comprehensive evaluation particularly for complex neuromusculoskeletal cases. In this study, the expert had extracted many clinical findings, using the TAREK approach, from different body regions that are axially pertinent to the realm of physical therapy and rehabilitation. Even though the patient has the



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