Case Report

Post traumatic cervical anterolithesis: comprehensive evaluation and expert opinion

Tarek El-gohary, PhD

Department of Biomechanics, Faculty of Physical Therapy, Taibah University, Egypt

Received 10 January 2018; revised 24 March 2018; accepted 25 March 2018; Available online 20 April 2018

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 biokinesiologic (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.\(^3\) 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. Patients who sustain macrotraumas, such as in MVAs, are more likely to receive physical therapy 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. 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 biokiniesiologic (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 are in agreement with the complexity of management of post-traumatic cervical spondylolisthesis especially when there is some degree of instability. Freedman et al. 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 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 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 medical diagnosis of anterolisthesis and derangement of C4 and C5 regions, the comprehensive evaluation prompted the therapist to evaluate different spinal regions in addition to the upper and lower extremities. Dunning et al.11 confirmed the need to evaluate the upper thoracic spine in patients with mechanical neck disorders. The therapist has involved the patient as an active partner in his rehabilitation program. Savolainen et al.12 emphasized on the role of having active treatment in addition to the passive treatment of neck-shoulder disorders. The therapist has educated the patient about different ways to control his symptoms and the red flag signs and symptoms regarding left arm radiculopathy. Young et al.13 underpin the necessity of including valid, reliable, and responsive functional scales in patients with cervical radiculopathy. The patient was also instructed about the best way to correct head-neck posture. The therapist applied skilled physical therapy manual techniques for the neck region and left shoulder complex. Leaver et al.14 reported the benefit of incorporating skilled manual techniques of mobilization and manipulation in patients with neck pain. The patient was instructed to start skilled physical therapy sessions and schedule a follow-up consultation with the expert to monitor the progress and modify the plan of care as indicated. Bialosky et al.15 encouraged the adoption of a comprehensive model using skilled manual therapy techniques to treat patients with musculoskeletal pain. The expert clinician in this case report would like to emphasize the role of active learning in promoting critical thinking in the clinical field. Maudsley and Strivens16 explained the role of contemporary medical education in emphasizing critical and experiential thinking in addition to adopting lifelong professional learning. Moreover, the problem-based learning is a distinguished approach to facilitate rather than direct learners. Academics must provide quality medical education that promotes critical thinking, aiming to develop competence and capabilities.16–18 In conclusion, complex rehabilitation cases need a thorough and systematic examination based on clinical reasoning and clinical judgment skills to unravel the underlying disorders that manifest the sophisticated clinical symptoms.

**Acknowledgements**

Thanks to the therapists at the outpatient clinic of Medical Rehabilitation Hospital, Almadinah Almunawwarah, KSA.

**References**

1. Report: Saudi Arabia records 526,000 road accidents annually. Available at: [http://english.alarabiya.net/en/News/middle-east/2016/01/01/Report-Saudi-Arabia-records-526-000-road-accidents-annually.html](http://english.alarabiya.net/en/News/middle-east/2016/01/01/Report-Saudi-Arabia-records-526-000-road-accidents-annually.html) [Accessed 9 March 2018].

2. Saudi Arabia. Road accidents account for most deaths in KSA. Available at: [http://www.arabnews.com/node/962936/saudi-arabia](http://www.arabnews.com/node/962936/saudi-arabia) [Accessed 8 March 2018].

3. Mamari FA, Al-Zalabani AH, Zaalat MM, Qabshawi RI. Road safety and road traffic accidents in Saudi Arabia. A systematic review of existing evidence. **Saudi Med J** 2015; 36: 418–424.

4. Ghaffar UB, Ahmed SM. A review of road traffic accident in Saudi Arabia: the neglected epidemic. **IJFCM** 2015; 2: 242–246.
5. Maudsley G, Strivens J. Promoting professional knowledge, experiential learning and critical thinking for medical students. Med Educ 2000; 34: 535–544.

6. Kuiper RA, Pesut DJ. Promoting cognitive and metacognitive reflective clinical reasoning skills in nursing practice: self-regulated learning theory. J Adv Nurs 2004; 45: 381–391.

7. El-gohary TM, Emara HA, Awadallah MF. Total assessment-reassessment& evaluation using biokinesiologic (TAREK) approach: case presentation for theoretical formulation. JPTS 2018; 30: 439–442.

8. Lisanti CJ, Hartness C. Combined flexion and extension cervical spine fractures with vascular injury. Mil Med 2009; 174: 1105–1107.

9. Freedman I, van Gelderen D, Cooper DJ, Fitzgerald M, Malham G, Rosenfeld JV. Cervical spine assessment in the unconscious trauma patient: a major trauma service’s experience with passive flexion-extension radiography. J Trauma Acute Care Surg 2005; 58: 1183–1188.

10. Niere KR, Torney SK. Clinician’s perception of minor cervical instability. Man Ther 2004; 9: 144–150.

11. Dunning JR, Cleland JA, Waldrop MA, Arnot C, Young I, Turner M, et al. Upper cervical and upper thoracic thrust manipulation versus nonthrust mobilization in patients with mechanical neck pain: a multicenter randomized clinical trial. J Orthop Sports Phys Ther 2012; 42(5): 18.

12. Savolainen A, Ahlberg J, Nummila H, Nissinen M. Active or passive treatment for neck-shoulder pain in occupational health care? A randomized controlled trial. Occup Med (Lond) 2004; 54: 422–424.

13. Young IA, Cleland JA, Michener LA, Brown C. Reliability, construct validity, and responsiveness of the neck disability index, patient-specific functional scale, and numeric pain rating scale in patients with cervical radiculopathy. Am J Phys Med Rehabil 2010; 89: 831–839.

14. Leaver AM, Maher CG, Herbert RD, Latimer J, McAuley JH, Jull G, et al. A randomized controlled trial comparing mobilization for recent onset neck pain. Arch Phys Med Rehabil 2010; 91: 1313–1318.

15. Bialosky JE, Bishop MD, Price DD, Robinson ME, George SZ. The mechanism of manual therapy in the treatment of musculoskeletal pain: a comprehensive model. Man Ther 2009; 14: 531–538.

16. Rethans JJ, Norcini JJ, Baron-Maldonado M, Blackmore D, Jolly BC, LaDuca T, et al. The relationship between competence and performance: implications for assessing practice performance. Med Educ 2002; 36: 901–909.

17. Meyers NM, Nulty DD. How to use (five) curriculum design principles to align authentic learning environments, assessment, students’ approaches to thinking and learning outcomes. Assess Eval High Edu 2009; 34: 565–577.

18. El-gohary TM. An introduction to scientific, educational, linguistic& Formative (SELF) evaluation strategies for a subject-specific multiple choice questions exams. Int J Chem Tech Research 2017; 10: 650–657.

19. El-gohary TM. Dr. El-gohary blueprint matrix: a feasible template purported to be a quick and simple guide for academics to design robust multiple choice questions exams. IJTRR 2017; 6: 38–44.

How to cite this article: El-gohary T. Post traumatic cervical anterolithesis: comprehensive evaluation and expert opinion. J Taibah Univ Med Sc 2018;13(5):479–482.