Available online at www.sciencedirect.com

ScienceDirect

Journal of the Chinese Medical Association 77 (2014) 26–30

www.jcma-online.com

Original Article

Economic burden of routine hematologic tests and intensive care unit observation for elective anterior cervical discectomy and fusion

Ching-Kuo Lin [a,b,c,d], Chih-Lung Lin [c,d,e], Yu-Tung Feng [e], Yu-Wa Lau [a,b,d], Cheng-Ying Chian [a,b,d], Yi-Tai Wu [a,b,d], Shiuh-Lin Hwang [c,d,e,*], King-Teh Lee [c,d,e,f]

[a] *Department of Emergency Medicine, Kaohsiung Municipal Ta-Tung Hospital, Kaohsiung, Taiwan, ROC*
[b] *Department of Emergency Medicine, Kaohsiung Medical University Hospital, Kaohsiung, Taiwan, ROC*
[c] *Division of Neurosurgery, Department of Surgery, Kaohsiung Medical University Hospital, Kaohsiung, Taiwan, ROC*
[d] *Department of Surgery, Faculty of Medicine, School of Medicine, Kaohsiung Medical University, Kaohsiung, Taiwan, ROC*
[e] *Graduate Institute of Healthcare Administration, Kaohsiung Medical University, Kaohsiung, Taiwan, ROC*
[f] *Division of Hepatobiliary Surgery, Department of Surgery, Kaohsiung Medical University Hospital, Kaohsiung, Taiwan, ROC*

Received March 30, 2013; accepted June 10, 2013

Abstract

Background: Anterior cervical discectomy and fusion is one of the most common surgical interventions performed by spine surgeons. As efforts are made to control healthcare spending because of the limited or capped resources offered by the National Health Insurance, surgeons are faced with the challenge of offering high-level patient care while minimizing associated healthcare expenditures. Routine ordering of postoperative hematologic tests and observational intensive care unit (ICU) stay might be areas of potential cost containment. This study was designed to determine the necessity of routine postoperative hematologic tests and ICU stay for patients undergoing elective anterior cervical discectomy and fusion and to investigate whether the elimination of unnecessary postoperative laboratory blood studies and ICU stay inhibits patient care.
Methods: The necessity for postoperative blood tests was determined if there were needs for a postoperative blood transfusion and hospital readmission within 1 month after surgery. The necessity for postoperative ICU observation was decided if immediate surgical intervention was required when any kind of complications occurred during the ICU stay.
Results: There were 168 patients collected in the study. Among them, all had routine preoperative and postoperative blood tests and were transferred to ICU for observation. No need for blood transfusion was observed, and no patient required immediate surgical intervention when the complications occurred during the ICU stay.
Conclusion: Cost savings per admission amounted to approximately 10% of the hospitalization cost by the elimination of unnecessary postoperative routine laboratory blood studies and observational ICU stay without waiving patient care in the current volatile, cost-conscious healthcare environment in Taiwan.

Keywords: anterior cervical discectomy and fusion; economic; elective; hematologic; intensive care unit; routine

1. Introduction

Anterior cervical discectomy and fusion (ACDF) is one of the most common surgical interventions performed by spine surgeons for degenerative cervical spondylosis (DCS).[1–4] The increasing number of ACDF procedures performed annually is believed to be attributed to the decreased length of hospital stays, decreases in complications, the provision of symptom relief and, more importantly, the improvement of quality of life.[3,5] As efforts are made to control healthcare spending because of the limited or capped resources offered by the National Health Insurance (NHI), surgeons are faced with the challenge of offering high-level patient care while minimizing associated healthcare expenditures.[3,4]

The authors declare that there are no conflicts of interest related to the subject matter or materials discussed in this article.

* Corresponding author. Dr. Shiuh-Lin Hwang, Division of Neurosurgery, Department of Surgery, Kaohsiung Medical University Hospital, 100, Tzyou 1st Road, San-Ming District, Kaohsiung 807, Taiwan, ROC.
E-mail address: shiuhlin.hwangns@gmail.com (S.-L. Hwang).

1726-4901/$ - see front matter
http://dx.doi.org/10.1016/j.jcma.2013.09.009

To maximize cost savings, Western spine surgeons have tried to change ACDF from a principally inpatient to an outpatient procedure.[6–10] However, the extensive adoption of this procedure as a standard of care has not occurred because different risks—complications such as intraoperative vascular injury, postoperative dysphagia, soft-tissue swelling, wound hematoma, esophageal or pharyngeal perforation, hardware failure, and nerve damage—must be taken into consideration.[11–14] Therefore, at most hospitals, ACDF remains an inpatient procedure with an average stay of 2–8 days.[4,5]

Routine ordering of postoperative hematologic tests[3] and postoperative observational stay in the intensive care unit (ICU) might be areas of potential cost containment. Vital signs, physical examination, and these blood studies are key determinants for surgeons deciding whether a patient needs a blood transfusion. Routine transfer of a patient into ICU after ACDF is also a part of a standardized postoperative order set at our neuroscience center to ensure prompt intervention is offered if complications occur. However, these blood tests and observational stay in the ICU have only become parts of a standardized postoperative order set and are ordered without regard for necessity or specific patient- or surgery-related factors.

In this study, the focus was to determine the necessity of routine postoperative hematologic tests and observational stay in the ICU for patients undergoing ACDF for DCS, i.e., to investigate whether the elimination of unnecessary postoperative laboratory blood studies and ICU stay for observation inhibits patient care.

2. Methods

After Institutional Review Board approval was obtained, the authors reviewed retrospectively the patient database of the Neuroscience Center of Kaohsiung Medical University Hospital and identified 266 consecutive patients with DCS who underwent ACDF for single- to multi-level diseases by neurosurgeons from January 2009 to December 2011 at their medical center (Fig. 1). Polyetheretherketone intervertebral cages and Bryan discs were used as fusion material. Patients were excluded based on C1-2 involvement, trauma, neoplasia, or previous cervical fusion/operation.

By reviewing the complete medical records, which consisted of operative notes, discharge notes, laboratory data, demographic and clinical data—including patient age, sex, number of levels involved, complications, pre- and

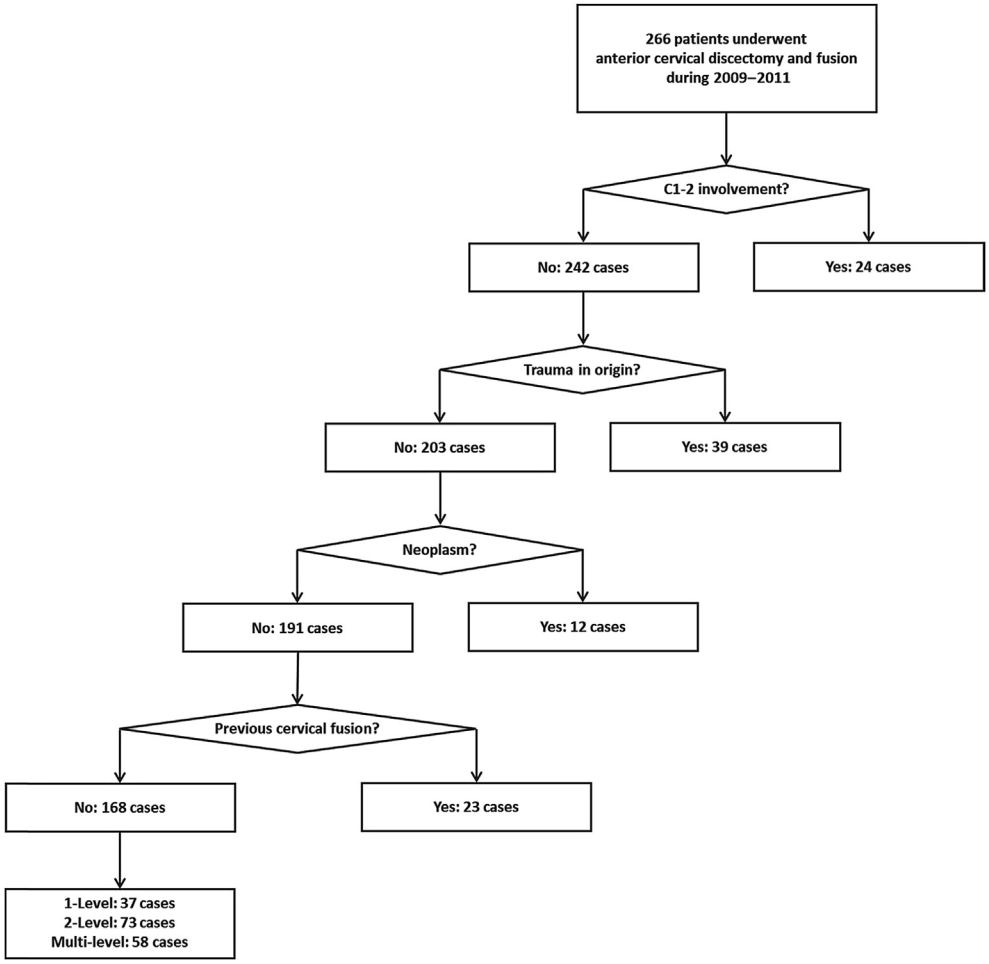

Fig. 1. Patient selection chart.