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Original research article

Comparison of perioperative complications following staged versus one-day anterior and posterior cervical decompression and fusion crossing the cervico-thoracic junction

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ABSTRACT

Introduction: Multilevel cervical pathology may be treated via combined anterior cervical decompression and fusion (ACDF) followed by posterior spinal instrumented fusion (PSIF) crossing the cervico-thoracic junction.

The purpose of the study was to compare perioperative complication rates following staged versus same day ACDF combined with PSIF crossing the cervico-thoracic junction.

Material and methods: A retrospective review of consecutive patients undergoing ACDF followed by PSIF crossing the cervico-thoracic junction at a single institution was performed.

Patients underwent either same day (group A) or staged with one week interval surgeries (group B). The minimum follow-up was 12 months.

Results: Thirty-five patients (14 females and 21 males) were analyzed. The average age was 60 years (37–82 years). There were 12 patients in group A and 23 in group B. Twenty-eight complications noted in 14 patients (40%) included: dysphagia in 13 (37%), dysphonia in 6 (17%), post-operative reintubation in 4 (11%), vocal cords paralysis, delirium, superficial incisional infection and cerebrospinal fluid leakage each in one case. Significant differences comparing group A vs. B were found in: the number of levels fused posteriorly (5 vs. 7; $p = 0.002$), total amount of intravenous fluids (3233 ml vs. 4683 ml; $p = 0.03$), length of hospital stay (10 vs. 18 days; $p = 0.03$) and transfusion of blood products (0 vs. 9 patients). Smoking and cervical myelopathy were the most important risk factors for perioperative complications regardless of the group.

Conclusions: Staging anterior cervical decompression and fusion with posterior cervical instrumented fusion 1 week apart does not decrease the incidence of perioperative complications.

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1. Introduction

Combined anterior–posterior cervical decompression and fusion crossing the cervico-thoracic junction is performed in patients with cervical deformity and multilevel spinal cord compression. There is much debate about performing combined anterior–posterior cervical decompressions and fusions as well as whether to perform staged or same day surgery. Complications in cervical spine surgery increase proportionately to the number of levels operated and total operative time [1]. Complications associated with multilevel cervical spine surgery include, dysphagia, dysphonia, postoperative airway compromise, non-union, infection, and medical complications. Estimated rates of airway compromise after cervical spine surgery range from 1.7% to 6%, and include a spectrum from postextubation edema to life-threatening acute airway obstruction [2–5]. General complication rate following anterior cervical decompression and fusion (ACDF) is reported to be lower than posterior spinal instrumented fusion (PSIF) [6]. Patients undergoing combined ACDF and PSIF, especially extended to cervico-thoracic junction are at greater risk of perioperative complications [7]. ACDF and PSIF may be staged (with several days interval) or performed on the same day, and the indication for staging these procedures is reported to be the patients general condition [8,9]. There is a paucity of data comparing the perioperative complication rate in patients undergoing staged versus same day combined anterior–posterior cervical decompression and fusion crossing the cervico-thoracic junction.

The aim of the study is to analyze and compare the perioperative complications following staged versus same day ACDF combined with PSIF crossing the cervico-thoracic junction.

2. Material and methods

A retrospective review of medical data of all consecutive patients undergoing ACDF followed by PSIF crossing the cervico-thoracic junction treated between January 2010 and October 2012 at a single institution was performed. The patients underwent either same day (Group A) or staged (Group B) surgery. All staged procedures were performed one week apart. All of the patients were operated on by the same surgical team (first and senior author). Patients underwent either anterior cervical diskectomies and fusions, anterior cervical corpectomies and fusion (ACCF), or hybrid constructs. Anterior interbody fusions were performed by use of allograft, PEEK cages filled with either allograft or autograft, fibular allograft strut, titanium mesh cages or expandable cages depending on pathology, number of levels treated and patients' preference. All patients were stabilized anteriorly with semi-constrained cervical plates (DePuy or Medtronic) spanning the operated segments.

PSIF included placement of cervical lateral mass, pedicle or intralaminar screws, and thoracic pedicle screws connected with 3.5 mm rods. Posterior decortication of the instrumented vertebrae and frozen allograft chips mixed together with local

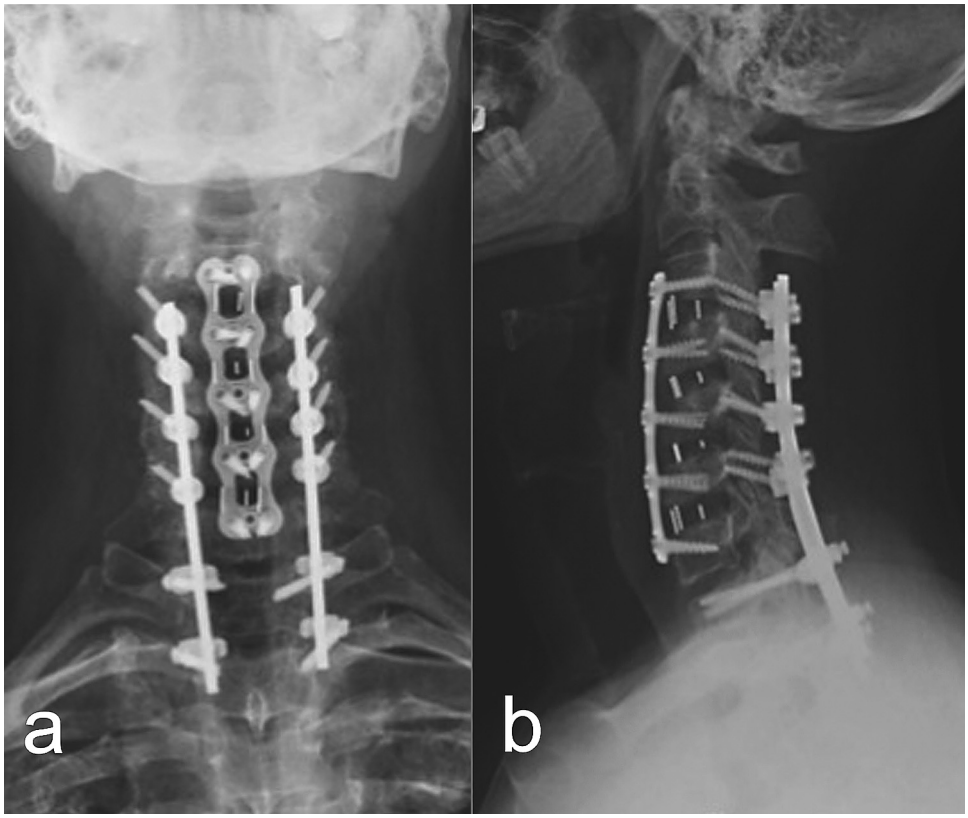

Fig. 1 – Upright neutral radiograph of the cervical spine demonstrating C3–C7 anterior cervical decompression and fusion and C3-Th2 posterior instrumented fusion: (a) antero-posterior view; (b) lateral view.

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