Case Report

Pericranial and scalp rotation flaps for occipitocervical hardware exposure with CSF leak in rheumatoid arthritis patient: A case report and review of the literature

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INTRODUCTION

Rheumatoid arthritis (RA) involves the cervical spine in 59–88% of cases and can result in cranial settling (CS)/basilar invagination (BI), retro-odontoid pannus formation, atlantoaxial instability, and atlantoaxial subluxation. The typical treatment for RA-related CS is a posterior occipitocervical fusion.¹ However, potential complications of occipitocervical fixation may include wound infection, hematomas, dural tears/cerebrospinal fluid (CSF) leaks, and instrumentation failure.² Herein, we describe a 33-year-old female who, following a C0–C3 fusion, developed an infection, screws pull-out, and a CSF leak. The CSF leak recurred and the...
wound dehisced, requiring complex plastic surgery closure with a scalp and pericranial rotation flap.

CASE REPORT

A 33-year-old female with RA presented with myelopathy. MR and CT studies documented BI, CCJI, and spinal cord compression [Figure 1a]. After informed consent, she was first treated with an occipitocervical fusion (C0–C3/C4) [Figure 1b]. However, 2 months later, she returned with paresthesias in both hands. The CT scan now showed pull-out of the cervical articular screws [Figure 1c]. Further, laboratory studies and the physical examination revealed a significant wound infection with a CSF leak.

The second surgery included removal of the articular screws and the application of bilateral C0–C3/C4 laminar clamps [Figure 1d]. The CSF leak, attributed to a cranial plate hole, was sealed with fibrin glue. However, the CSF fistula persisted postoperatively, warranting the placement of a spinal drain 3 days later [Figure 2]. When the microbiological analysis showed Pseudomonas aeruginosa, proper antibiotic therapy was started. Two weeks later, she underwent a third operation. With the help of a plastic surgeon, a pericranial flap was elevated and rotated over the instrumentation. Next, a left pedicle rotation scalp-flap was raised in the avascular subgaleal plane; it was rotated over the pericranium, filling the defect without tension. A Penrose drain was maintained for 24 h [Figure 3]. Postoperatively, the wound healed adequately. Six months later, she fully recovered neurological function without further infection or wound breakdown [Figure 4]. Fusion was also subsequently confirmed on the 6-month postoperative CT scan.

DISCUSSION

RA patients have cervical spine involvement in up to 85% of cases, and CS/BI is one of the most frequent complications. Its treatment typically involves occipitocervical fusions, complications of which may include dural tears/CSF leakage, improper screw placement/instrumentation failure, and infections.[2] If such complications arise, they may require complex occipitocervical wound/fusion revisions.

Rotation of complex occipitocervical flaps with plastic surgery

Coverage of exposed occipitocervical wound dehiscence may warrant the rotation of complex flaps in conjunction with plastic surgery.

Koop et al. proposed using a periosteal turndown flap and subsequent fixation through the flap with wires, screws, hooks, or plates to aid fusion; this technique has been successfully used over the years.[3,4] Our modification was to rotate both skin and pericranial flaps down, and to drape these over the instrumentation. This offered a double-layer barrier for preventing recurrent CSF leakage, separated the occipital plate from the skin,
reduced the wound pressure, and improved vascularization to the surrounding tissues.[6] Similarly, the pericranial flap provided viable osteogenic cells, bolstering the arthrodesis, and increasing its success rate.

CONCLUSION
Occipitocervical instrumented fusion dehiscence can be successfully treated with a combination of scalp and pericranial rotation flaps utilized to cover the exposed instrumentation.

Declaration of patient consent
Patient’s consent not required as patients identity is not disclosed or compromised.

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Conflicts of interest
There are no conflicts of interest.

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