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Combined access in rigid atlanto-axial dislocations

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Background Reduction of rigid atlanto-axial dislocations is challenge in current spinal surgery. Their relatively low prevalence and various genesis (abnormal developments, neglected trauma, rheumatoid damages) do not allow developing the unique treatment tactic. In most of cases only posterior access is advised with reduction and further fixation, while combined surgery is little described. However in atlanto-axial dislocation due to displacement of odontoid process, application of dorsal access can be insufficient.

Research question Description of combined surgery technique application in treatment of rigid atlanto-axial dislocations.

Design Clinical series.

Methods Surgical treatment of three patients with rigid atlanto-axial dislocations: in two cases – against neglected fracture of odontoid process C2 type II by Anderson&D'Alonzo with kyphotic position, in one case – odontoid bone with severe ventral displacement. All patients had rigid atlanto-axial dislocation according to the stress radiography diagnostics. Combined two-stage surgery during one surgical session was used as a treatment method. During first stage was used the release of odontoid process in its base by ventral access made by classic anterolateral approach by Smith-Robinson in projection of C3-C4 segment. Palpating the anterior arch of atlas under C-arm control the odontoid process was "disconnected" from vertebral body C2 using the chisel. Then atlanto-axial complex mobility was checked (according to the X-ray control data) using distractor for posterior screw stabilization system. The turning of patient with further dorsal access and posterior screw stabilization by Goel-Harms technique was made after mobilization of odontoid process.

Results The successful reduction of atlanto-axiall dislocation was achieved without intraoperative complications and aggravation of neurologic disorders in all three patients. The average time of surgical treatment was 165 minutes and blood-loss was about 100 ml..

Discussion Combined surgery in atlanto-axial dislocations is little-known. In most cases the posterior surgery with "wobbling" of C1-C2 segment through articular surfaces is used. However in rigid kyphotic position of odontoid process (especially in neglected trauma) this technique does not have effect on. Rare descriptions of combined techniques recommend using submaxillary access which is more difficult in technical application. Presented technique of anterior release based on widely used access by Smith-Robinson which makes its application easy.