

Beach chair position



Although the [beach chair position](#) (BCP) is widely used during shoulder surgery, it has been reported to associate with a reduction in [cerebral blood flow](#), oxygenation, and risk of [cerebral ischemia](#).

The Brain Physics Laboratory, Division of Neurosurgery, Department of Clinical Neurosciences, University of [Cambridge](#), Department of Anesthesiology, Pharmacology & Therapeutics, The University of British Columbia, Vancouver, Neurosciences Critical Care Unit, Addenbrooke's Hospital, Cambridge University Hospitals NHS Foundation Trust, Department of Neuroscience, University of Genoa, Department of Anaesthesia and Intensive Care, San Martino Policlinico Hospital, Genoa, Department of Anaesthesia, Addenbrooke's Hospital, Cambridge, Department of Trauma and Orthopaedics, Addenbrooke's Hospital, Department of Neurology, University Hospital Chemnitz, Chemnitz, Germany, Department of Anaesthesiology, University of Auckland, Institute of Electronic Systems, Warsaw University of Technology, Warsaw, Poland, assessed cerebral haemodynamics using a multiparameter transcranial Doppler-derived approach in patients undergoing shoulder surgery. 23 anaesthetised patients (propofol (2 mg/kg)) without history of neurologic pathology undergoing elective shoulder surgery were included. Arterial blood pressure (ABP, monitored with a finger-cuff plethysmograph calibrated at the auditory meatus level) and cerebral blood flow velocity (FV, monitored in the middle cerebral artery) were recorded in supine and in BCP. All subjects underwent interscalene block ipsilateral to the side of FV measurement. We evaluated non-invasive intracranial pressure (nICP) and cerebral perfusion pressure (nCPP) calculated with a black-box mathematical model; critical closing pressure (CrCP); diastolic closing margin (DCM-pressure reserve available to avoid diastolic flow cessation); cerebral autoregulation index (Mxa); pulsatility index (PI). Significant changes occurred for DCM [mean decrease of 6.43 mm Hg ($p = 0.01$)] and PI [mean increase of 0.11 ($p = 0.05$)]. ABP, FV, nICP, nCPP and CrCP showed a decreasing trend. Cerebral autoregulation was dysfunctional ($Mxa > 0.3$) and PI deviated from normal ranges ($PI > 0.8$) in both phases. ABP and nCPP values were low (< 60 mm Hg) in both phases. Changes between phases did not result in CrCP reaching diastolic ABP, therefore DCM did not reach critical values (≤ 0 mm Hg). BCP resulted in significant cerebral haemodynamic changes. If left untreated, reduction in cerebral blood flow may result in brain ischaemia and post-operative neurologic deficit ¹⁾.

¹⁾

Cardim D, Robba C, Matta B, Tytherleigh-Strong G, Kang N, Schmidt B, Donnelly J, Calviello L, Smielewski P, Czosnyka M. Cerebrovascular assessment of patients undergoing shoulder surgery in beach chair position using a multiparameter transcranial Doppler approach. J Clin Monit Comput. 2018 Oct 17. doi: 10.1007/s10877-018-0211-7. [Epub ahead of print] PubMed PMID: 30328561.

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