

**Table 2: Reviewed articles for jugular vein dimension and intracranial pressure (ICP)**

Reference	Country	Article Type & Subjects	Observations Measurements	Key Findings	Weaknesses
Craig et al., 1991 <sup>25</sup>	UK	Case review: 2 patients	Intracranial pressure and collar use	Collar use was associated with impaired venous drainage and as such relates to an increase in ICP	Only two patients
Lemyze et al., 2011 <sup>28</sup>	France	Case review: 1 patient	Level of consciousness	Collar use post hanging may exacerbate cerebral oedema due to compression of neck veins	Only one patient
Dunham et al., 2008 <sup>32</sup>	USA	Literature Review	Risks with MRI and collar use	Collar use is associated with a rise in ICP, and secondary brain injury; early collar removal advocated	Evidence supports the theory but no substantial proof
Ho et al., 2002 <sup>7</sup>	China	Literature Review	Intracranial pressure and collar use	Collars appear to act like a tourniquet around the neck, potentially exacerbating a head injury and increasing ICP	Evidence supports the theory but no substantial proof
Dunham et al., 2011 <sup>8</sup>	USA	Simulation study	Collar use and outcome	Early collar removal is advocated for unstable/high risk and stable patients with spinal injuries	Simulation study only; no real proof for claims
Davies et al., 1996 <sup>5</sup>	UK	Study: 19 patients	ICP before and after collar application	Stifneck collar may cause a rise in intracranial pressure.	Supports hypothesis for collars affecting ICP but exact mechanism for rise in ICP was not determined
Hunt et al., 2001 <sup>29</sup>	UK	Study: 30 patients	ICP before and after collar application	Collars are associated with a rise in intracranial pressure, potentially worse if the ICP is higher to start with	Supports hypothesis for collars affecting ICP but exact mechanism for rise in ICP was not determined
Kolb et al., 1999 <sup>34</sup>	USA	Study: 20 patients	Cerebrospinal fluid pressure before and after collar application	Cerebrospinal fluid pressure increased after collar application, but no clear associated with BMI	Collars were placed when the patient was inclined to the side rather than supine; exact mechanism for rise in ICP was not determined
Kuhnigk et al., 1993 <sup>30</sup>	Germany	Study: 18 patients	Intracranial pressure and collar use	Found no correlation between collar use and increased intracranial pressure	Baseline ICP readings were higher than in other reports and as such may have had an impact on the results
Mobbs et al., 2002 <sup>9</sup>	Australia	Study: 10 patients	ICP before and after collar application	Intracranial pressure was higher following the application of a collar	Supports hypothesis for collars affecting ICP but exact mechanism for rise in ICP was not determined
Stone et al., 2010 <sup>31</sup>	USA	Study: 42 volunteers	Jugular vein dimensions before and after collar application	Collar application associated with alteration to jugular vein diameter indicative of venous obstruction	Supports hypothesis for collars affecting ICP but no mechanism was determined as actual ICP was not measured
Porter et al., 1999 <sup>27</sup>	UK	Study: 9 patients	ICP before and after collar application	All patients showed a rise in ICP following collar application	Supports hypothesis for collars affecting ICP but no mechanism was determined
Ferguson et al., 1993 <sup>10</sup>	UK	Study: 5 patients	Tissue Interface Pressure around neck area	Normal jugular venous pressure when supine was 2-7mmHg, concluded pressures exerted on the neck over this will cause a 'back pressure'	Supposition rather than fact with the relationship of collar use to increased ICP
Raphael et al., 1994 <sup>26</sup>	UK	Study: 9 patients	Cerebrospinal fluid pressure before and after collar application	7/9 experienced raised cerebrospinal fluid pressure following collar application	Supports hypothesis for collars affecting ICP but no mechanism was determined