Percutaneous Balloon Compression for the treatment of Trigeminal Neuralgia

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Akademisk avhandling

som med vederbörligt tillstånd av Rektor vid Umeå universitet för avläggande av filosofie/medicine doktorsexamen framläggs till offentligt förvar i Hörsal B, Unod T9, fredagen den 17 maj, kl. 13:00.
Avhandlingen kommer att förvaras på engelska.

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Abstract

**Background.** Trigeminal neuralgia (TN) is a paroxysmal unilateral facial pain condition. That it is rather rare is of little comfort to those who are affected, as TN is often described as one of the worst pains known to mankind. Advanced age and multiple sclerosis (MS) are risk factors for developing TN. The first line of treatment is medical, primarily with carbamazepine. When medical treatment fails, as it does in many patients, there are several surgical options. One of the minimally invasive options, suitable for patients with comorbidity, is percutaneous balloon compression (PBC). Despite its introduction in the early 1980s, PBC is arguably the least well studied of the minimally invasive procedures for the treatment of TN.

**Aims.** The aim of this thesis was to evaluate the efficacy of PBC, both overall and in MS-TN patients specifically. Further, it intended to identify and evaluate pre- and intraoperative parameters associated with the efficacy of PBC. It also investigated changes in sensory function after PBC, and identified side effects and complications associated with PBC. Finally, it sought to evaluate how efficacy, side effects and complications differed between PBC and another minimally invasive technique; percutaneous retrogasserian glycerol rhizotomy (PRGR).

**Methods.** Cohorts of patients treated with PBC in Umeå and Stockholm, and with PRGR in Umeå, were followed retrospectively. Data from an existing database was combined with data from medical records, radiographs and telephone interviews.

**Results.** After PBC, 90 % of the patients were completely pain free without medication for TN. The median time to recurrence of pain was 28 months. In patients with concurrent MS, the initial success rate was 67 % and the median time to recurrence was 8 months. In patients without MS, who had not previously been treated surgically, the initial success rate was 91 % and the median time to recurrence was 48 months. The procedure could, however, be repeated with good results. A good compression, indicated by a pear-shaped balloon as seen on intraoperative lateral radiograph, was crucial to achieve good pain relief. Postoperative hypoesthesia was present in the majority of patients, but after 3-6 months, sensibility was partly or fully normalized in most patients. Severe complications were rare, but included transient cardiac arrest, meningitis and dysesthesia. The side effects profile was favorable to that of percutaneous retrogasserian glycerol rhizotomy, in that the latter produced more cases of dysesthesia and decreased corneal sensibility. The efficacy of the two treatments were, however, not significantly different.

**Conclusions.** PBC is an effective and relatively safe treatment option for patients with TN refractory to medical treatment. It deserves its place among the standard treatments for TN, and could be considered for those patients eligible for surgery for which open surgery is a less suitable option.

**Keywords**

trigeminal neuralgia, multiple sclerosis, surgery, percutaneous balloon compression, percutaneous retrogasserian glycerol rhizolysis