# Hartel approach

Transjugal-transoval route of Hartel was first described by Hartel in 1912, for alcohol injection at the level of the Gasserian ganglion to treat trigeminal neuralgia. Then this route was extensively used with the same indication for performing percutaneous destructive procedures of the trigeminal system, by thermocoagulation, balloon compression or glycerol injection.

This route was also used for inserting EEG electrodes to explore patients affected with refractory temporo-mesial epilepsy with the purpose of resective surgery.

The first attempts of percutaneous biopsy to the middle fossa region were by Stechison and Bernstein in 1989, then by Dresel et al. in 1991 [1].

Currently Hartel approach is the most commonly used method to access the Gasserian ganglion. However, this approach is associated with high recurrence rate and technical difficulties in certain patients with foramen ovale (FO) anatomical variations. In a study, Ding et al., assessed the feasibility of accessing the Gasserian ganglion through the FO from a mandibular angle under computed tomography (CT) and neuronavigation guidance.

A total of 108 patients with trigeminal neuralgia (TN) were randomly divided into 2 groups (Group G and Group H) using a random number table. In Group H, Hartel anterior approach was used to puncture the FO; whereas in Group G, a percutaneous puncture through a mandibular angle was used to reach the FO. In both groups, procedures were guided by CT imaging and neuronavigation. The success rates, therapeutic effects, complications, and recurrence rates of the 2 groups were compared.The puncture success rates in Group H and Group G were 52/54 (96.30%) and 49/54 (90.74%), respectively (P=0.24). The 2 procedural failures in Group H were rescued by using submandibular trajectory, and the 5 failures in Group G were successfully reapproached by Hartel method. Therapeutic effects as measured by Barrow Neurological Institute (BNI) pain scale (P=0.03) and quality of life (QOL) scores (P=0.04) were significantly better in Group G than those in Group H at 36 months posttreatment. Hematoma developed in 1/54 (1.85%) cases in Group H, and no cases of hematoma were observed in Group G (P=0.33). In Group H, RFT resulted in injury to the unintended trigeminal nerve branches and motor fibers in 27/52 (51.92%) cases; in Group G, it resulted in the same type of injury in 7/49 cases (14.29%) (P<0.01). In Group H, the 24- and 36-month recurrence rates were 12/51 (23.53%) and 20/51 (39.22%), respectively; in Group G, these recurrence rates were 7/49 (12.24%) and 9/49 (16.33%, P=0.03), respectively.CT- and neuronavigation-guided puncture from a mandibular angle through the FO into the Gasserian ganglion can be safely and effectively used to deliver RFT for the treatment of pTN. This method may represent a viable option to treat TN in addition to Hartel approach [2].

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http://www.springer.com/cda/content/document/cda_downloaddocument/9783709106754-c.pdf?SGWID=0-0-45-1259038-p174103307
2)
Ding W, Chen S, Wang R, Cai J, Cheng Y, Yu L, Li Q, Deng F, Zhu S, Yu W. Percutaneous radiofrequency thermocoagulation for trigeminal neuralgia using neuronavigation-guided puncture from a mandibular angle. Medicine (Baltimore). 2016 Oct;95(40):e4940. PubMed PMID: 27749549.