Platelet-Rich Plasma as a Novel Treatment of Painful Traumatic Trigeminal Neuropathy (PTTN)-Six Month Results

Christopher Zarembinski, M.D., Katayoun Omrani, D.D.S.
The Pain Center, Cedars-Sinai Hospital, Los Angeles, California U.S.A.
E-mail: zar65@sbcglobal.net

Objectives. **This study was designed to evaluate the pain response in painful traumatic trigeminal neuropathy (PTTN) after injection of platelet-rich plasma into the sphenopalatine ganglion. Symptoms are often described as a constant burning, or shooting pain. Typically, there is a clear history of trauma associated with the onset of pain. Most cases occur in females in their 4th decade. A lesion must be present in the trigeminal distribution to cause a continuous neuropathy. The incidence following injuries to the peripheral branches of the trigeminal nerve following implants, 3rd molar extractions, orthognathic surgery, mid-face fractures, or root canal surgery, is around 3-5%. These findings define painful traumatic trigeminal neuropathy (PTTN).**

Methods. **Ten patients with diagnosed painful traumatic trigeminal neuropathy (PTTN) were initially treated with a sphenopalatine ganglion block with 1 ml of 1% lidocaine and 1 ml of dexamethasone (4 mg/ml). Eight of the ten patients reported more than 60% improvement for one week, and were then given a sphenopalatine ganglion injection with autologous platelet-rich plasma one month later. Pain results were recorded at 6 months postoperatively. The technique for the sphenopalatine ganglion block was the fluoroscopic placement of a 25 g 2 ½ inch needle adjacent to the coronoid notch of the mandible and advanced to the contact the lateral pterygoid plate in the lateral decubitus position. Needle tip was then re-directed to enter the sphenopalatine fossa and position determined by both AP and lateral imaging. One-fourth ml of iohexol (240 mg/ml) confirmed needle placement (Fig. 1, Fig. 2). Platelet-rich plasma was initially harvested with an aseptic draw of 60 ml of venous blood, which was placed in a Biomet centrifuge at 3200 rpm for 15 minutes, which produced approximately 6 ml of platelet-rich plasma. The patients then received 2 ml of platelet-rich plasma into the sphenopalatine fossa, and were asked to follow up at 6 months.**

Results. **Five of the eight patients injected with platelet-rich plasma had more than 60% improvement at 6 month follow up. There were no complications. All patients stated they would recommend the procedure to other patients. Average age was 49 years. Seven out of eight patients had involvement of V2, as compared to six out of eight with V3 involvement. Seven out of eight patients were female. There were no complications. Constant, throbbing, and burning were the most common descriptors used. In general, the procedure was well tolerated, and all patients stated they would recommend the procedure to other patients. Patients with a favorable response had an average duration of symptoms of 5 years prior to the procedure, versus 10 years for those patients who did not respond to treatment.**

Conclusions. **Patients with painful traumatic trigeminal neuropathy have a favorable outcome to platelet-rich plasma injection of the sphenopalatine ganglion at 6 months. Meticulous fluoroscopic-guided needle placement with AP and lateral views supported by contrast agent is critical for accurate deployment. This small study was limited by the lack of a placebo control. Nonetheless, the lack of placebo control can hardly explain the positive effect on five out of eight patients that lasted throughout the 6 months. Favorable response to PRP was clearly better with a shorter duration of symptoms, suggesting that earlier intervention may be important.**

Several points should be considered in future studies:

1. **Optimized preparation of PRP needs to be defined to standardize treatment. The concentration of platelets and growth factors, frequency of treatment, and volume of injectate, should be carefully explored.**
2. **The exact interaction of growth factors for neurogenic applications in PRP is unclear.**
3. **The optimal time to intervene with PRP injection of the sphenopalatine ganglion after onset of symptoms is also unclear. Clearly, a larger study may offer insight into some of these areas.**

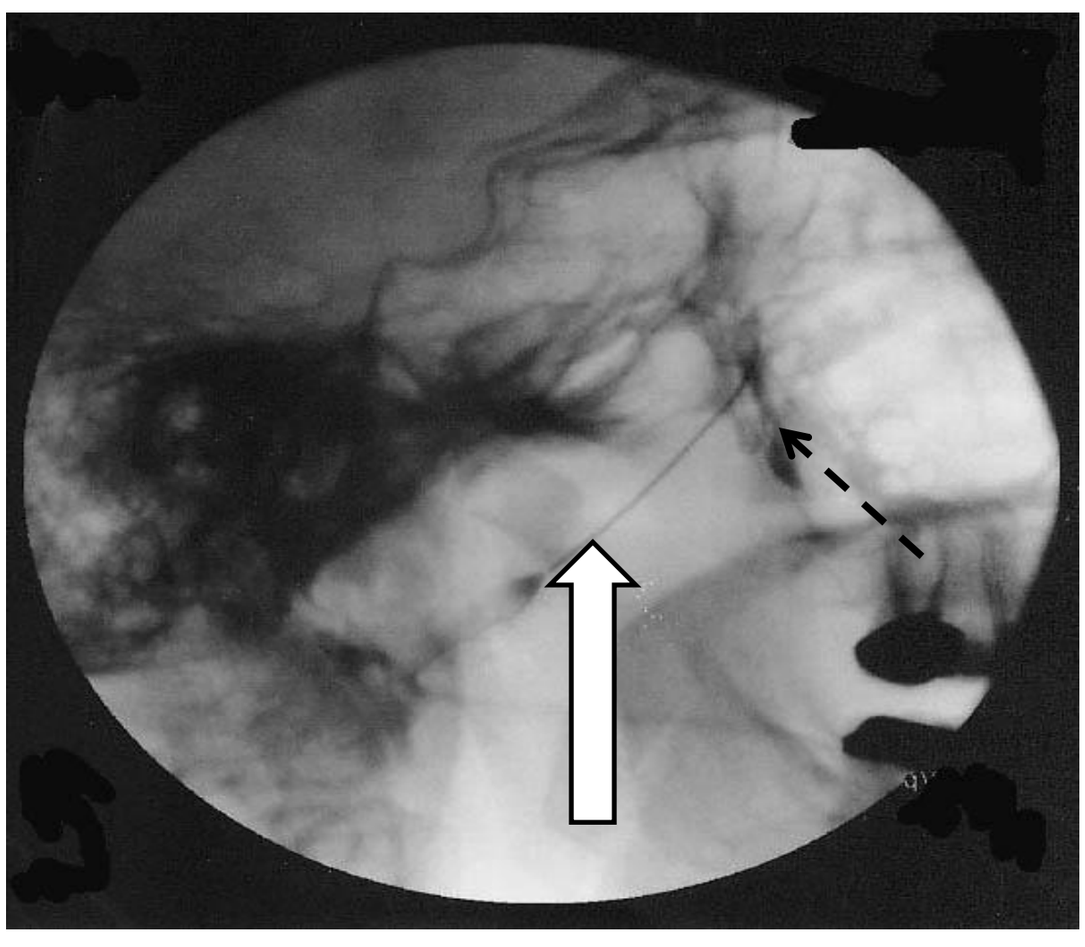

Fig. 1. Lateral image of sphenopalatine ganglion block with needle in place (white arrow) and contrast within sphenopalatine fossa (dashed arrow).

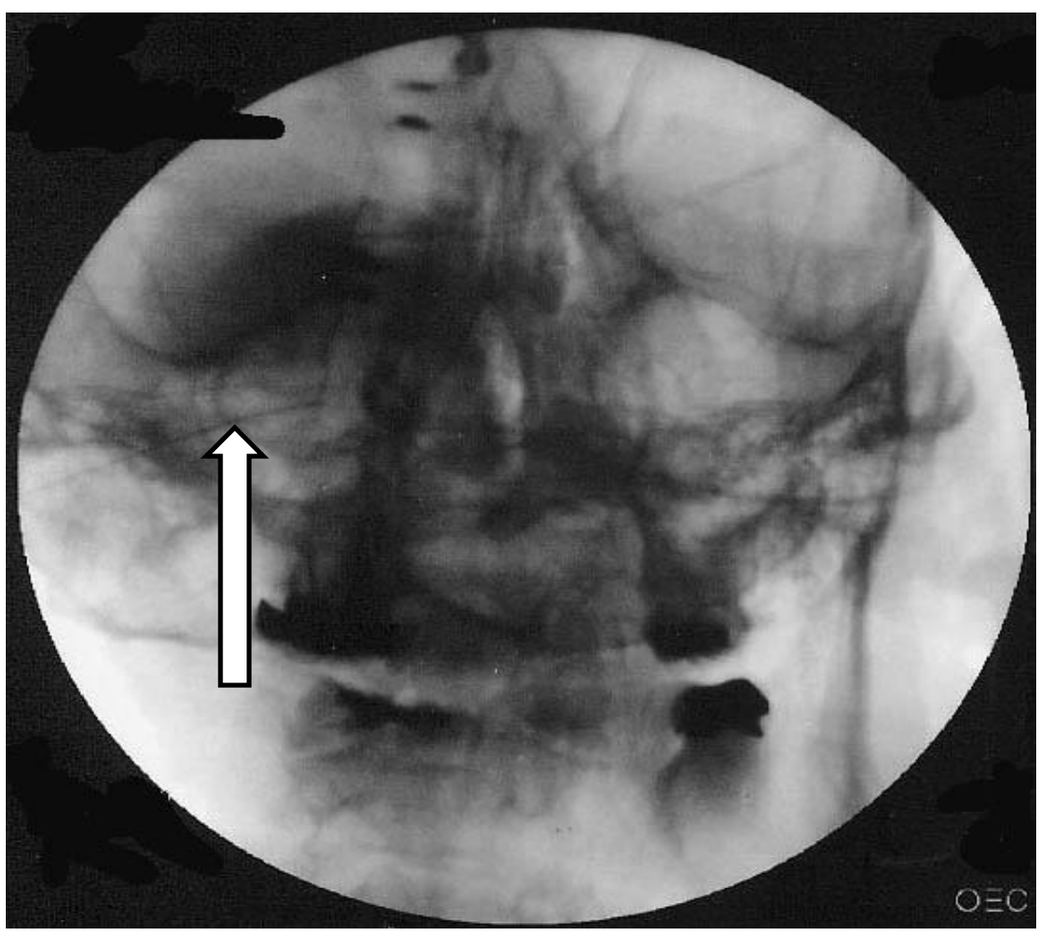

Fig 2. AP image of sphenopalatine ganglion block with needle in place (white arrow).