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Sphenopalatine Ganglion Block for Post-Dural Puncture Headache Treatment

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Title and Author

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Summary

Wesley Gallagher

Introduction of the Problem

Post-dural puncture headache (PDPH) is a rare but debilitating complication of accidental or intentional dural puncture which manifest as an orthostatic, fronto-occipital headache (Wendling & Euliano, 2011). The risk of PDPH from neuraxial techniques ranges from 0.5%-2%, however given the large number of dural punctures performed every year, the incidence of PDPH in the United States is around 20,000 per year (Sachs & Smiley, 2014).

There are several different treatments identified in the literature for PDPHs. Most are minimally effective at best. At present the gold standard for PDPH treatment is the epidural blood patch (EBP). Despite this fact, EBPs are a highly invasive procedure associated with significant cost, variable success, rare but serious complications, and requires considerable provider experience. Providers at many hospitals, including a specific central Illinois regional facility, often turn to the EBP before attempting the less risky therapeutic modalities that are available to them and supported by the literature.

The purpose of this project is to develop a protocol for administering the sphenopalatine ganglion (SPG) block with the SphenoCath technology and to demonstrate the usability of that protocol as a minimally invasive, first-line treatment for PDPHs at a community hospital in central Illinois. The idea for this project was facilitated by a staff Certified Registered Nurse Anesthetist (CRNA) at a 93-bed community hospital located in central Illinois. This hospital reported 361 live births for 2016 and experiences approximately 1 PDPH per month ("Passavant

Hospital," n.d., M. Bednarchik, personal communication, January 18, 2017). At the request of the stakeholder, and with the support of the facility, a protocol was developed to implement the SPG block using the SphenoCath technology as a first-line treatment option for PDPHs.

Anesthesia providers at this hospital, including anesthesiologist and CRNAs currently treat PDPH with a combination of conservative therapy and EBP depending on the duration and severity of symptoms. The providers were not completely satisfied with their PDPH treatment armamentarium and were actively seeking out alternatives, including SPG blocks.

Literature Review

The SPG block is a regional anesthetic technique developed in 1908 and consists of using local anesthetics to block the parasympathetic signals, which flow through the SPG. Current theories state that increased parasympathetic outflow is the trigger for many forms of headaches, including PDPHs, which suggest the potential for the SPG block to effectively treat PDPHs.

There is strong evidence in the literature suggesting EBP is the most effective treatment for PDPHs. The literature also shows the efficacy of EBPs are highly variable. EBPs are associated with rare, but serious complications, and less than perfect patient tolerance. Relief was often said to be incomplete and temporary for a significant number of patients in the studies evaluating EBP. A thorough discussion of the literature evaluating the advantages and disadvantages of the EBP can be found in the Literature Review section of this project on the SPARK repository.

The SPG block has recently emerged in the literature as a less invasive alternative to the EBP. Owing to the inherent difficulty studying PDPH treatments via randomized controlled trials, the evidence supporting SPG blocks for PDPH treatment is not as strong compared to the EBP. The eight studies conducted thus far have consistently shown a fast onset with an efficacy

and safety profile that rivals EBP. The procedure is simple to perform with equipment that is readily available at most healthcare facilities. The literature does however suggest potential problems with SPG block for PDPH treatment. Namely, the duration of action is often not long enough to cover the PDPH until the dural tear can heal spontaneously. The SPG block needs to last long enough to allow the CSF to regenerate to a point where the intrathecal hypotension is resolved. Despite limitations in the research, there is enough evidence to both support the use of SPG blocks for PDPH treatment and to guide the development of a SPG block protocol for Passavant Hospital.

Project Methods

The purpose of the project is to develop a SPG block protocol for the treatment of PDPHs at a central Illinois community hospital. Based on the preliminary nature of the project and the rarity of PDPHs at the chosen facility, an evaluation of the accessibility, usability, and satisfaction of the protocol, via survey, was conducted amongst a convenience sample of the anesthesia providers at that facility. An exempt IRB was granted by Southern Illinois University Edwardsville. No IRB was required through Passavant Hospital per hospital administration. Throughout the project, the staff at Passavant Hospital were supportive, and interest in participating was strong. There were no significant risks or threats identified to either the participants or patients during implementing or evaluation the protocol. There were challenges in implementing and evaluating the project, which are discussed in detail in the evaluation section.

Evaluation

A survey was chosen as the method of evaluation for this project. The survey method of evaluation has several advantages. Surveys can collect data on dimensions of process

improvement projects which are typically difficult to measure such as knowledge, intentions, opinions, and attitudes. Surveys can capture both quantitative and qualitative data. Statistical analyses can be performed on the data. Also, surveys require brief responses which can potentially increase the number of responses obtained. Weaknesses of surveys include the fact that they yield superficial responses and that it is often difficult to make any conclusions or generalizations from the data obtained because the sample sizes are usually small (Polit & Beck, 2010).

The weaknesses previously mentioned were experienced during the evaluation of this project. Owing to unforeseen issues with the implementation and evaluation of the project, a total of nine surveys were collected. One survey was excluded, because it was incomplete. The third section of the survey (except for the comment section) was not included in the analysis because it was discovered anecdotally that only one provider had the opportunity to utilize the protocol, which was attributed to the rarity of PDPHs at this facility. It was initially planned to perform descriptive statistical analyses to the data obtained from the surveys, however due to the low number of surveys obtained no reliable conclusions could be drawn from the data.

Complications with the evaluation of the project led the author to seek out alternative evidence-based practice evaluation methods, which could have provided more robust conclusions, for implementation of similar projects in the future. One method identified was a focus group. According to Polit and Beck (2010), the focus group can be an ideal evidence-based practice evaluation method for groups of five to ten people. It is efficient and can generate a great deal of dialogue. Qualitative and quantitative data can be obtained, and there are well validated analytical tools to study the data obtained from focus groups. One potential

disadvantage in using a focus group is that some people may not feel comfortable sharing in front of a group.

The most useful information about the protocol came from anecdotal evidence obtained from informal discussions with the anesthesia providers at the facility, which in some ways is analogous to a focus group. Some of the anecdotal evidence obtained included that the protocol was only utilized by one provider. This provider utilized the protocol on three different patients who all presented to the emergency department (ED) of the hospital with symptoms consistent with PDPH. The SPG block was successful every single time and none of the patients treated with the protocol required admission to the hospital; nor did they require further treatment with conservative modalities or additional SPG blocks. Most importantly none of the patients required an EBP. Another anesthesia provider at the facility stated that they were aware of many discussions recently concerning the use of SPG blocks for PDPH treatment. They liked the protocol, and were interested in the opportunity to use it on a real patient. The results of the survey are presented in graph form in Appendix F for the sake of completeness.

Impact on Practice

Per the stakeholder at the central Illinois hospital, they plan on continuing to offer the SPG blocks using the developed protocol as a less invasive, first-line option to treat PDPHs. The author and stakeholder discussed implementing training of the ED on the use of the protocol and processes for consulting the on-call anesthesia staff to respond promptly to patients who present with the symptoms of PDPH to facilitate the rapid evaluation and treatment of these patients with the SPG block protocol. However, there are no immediate plans to do so.

Conclusions

The creation and implementation of the SPG block protocol for the treatment of PDPHs has provided this central Illinois hospital with another tool in the armamentarium of its anesthesia providers for the effective, and least invasive treatment of PDPHs. The lessons learned from the creation, implementation, and evaluation of this protocol can serve as a guide for other anesthesia providers to implement this novel treatment for PDPHs in their facility.

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Appendix F: SPG Block Protocol Survey Results

