Allergic Reactions: A Pain Physician's Review on Evaluation and Treatment

Pain procedures can be a challenging but integral part of Pain Management. Although not always recommended, sedation can be used for pain procedures on a case-by-case basis. We present an educational case of an allergic reaction after two pain injections for a patient requesting sedation. As physicians, it is optimal to keep a wide differential diagnosis in patients that have complications not only from the procedure but from the sedation itself. Our role as treating physicians often spans beyond the scope of Pain Management, and our knowledge and broad skill set may be emergently required for patient stabilization and treatment.

A 57-year-old male without medical or surgical history, and no known drug allergies, was recommended lumbar Medial Branch Blocks (MBB) due to his symptomatic, facet-mediated pain. The patient refused to do the procedure without intravenous sedation. On the day of his procedure, he was given intravenous Propofol in small boluses for sedation. His lumbar medial branch blocks were performed with preservative-free 0.25% Bupivacaine after Omnipaque 240mg/mL contrast was used to document absence of vascular uptake. The procedure was completed without complications, and the patient was taken to recovery uneventfully. Fifteen minutes later in PACU, he developed a diffuse urticarial rash with otherwise normal vital signs and cardiorespiratory status. Fifty milligrams of intravenous Diphenhydramine was administered which promptly cleared up his rash. After prolonged observation, he was eventually discharged with his spouse in asymptomatic condition. They were also clearly instructed on home use of Diphenhydramine and to watch for signs of cardiorespiratory compromise. They did not want to see an allergist at this time.

The patient returned to the Pain Clinic the next week without further symptoms. Due to the diagnostic improvement after his MBB, Radiofrequency Ablation (RFA) was recommended. The patient requested intravenous sedation again. An extensive conversation occurred and was documented discussing the risks and benefits of proceeding with another injection and sedation.

Prior to the RFA, emergency medications and equipment discussed below were immediately available. This pre-preparation was agreed upon by the Anesthesia team and the Pain Management physician. No contrast was used for the RFA as this was not routinely used during RFAs, and also it was considered a potential allergen. Preservative-free 2% Lidocaine was used prior to the initiation of the RFA. He was again transported to recovery in asymptomatic condition. Fifteen minutes later, he developed the same rash with stable vital signs that resolved with IV Diphenhydramine. He was ultimately referred to an allergist, and an unopened vial of all agents was delivered to the allergist. Testing was done for all the administered medications, and the results ultimately showed the patient had an allergy to Propofol.

A literature search for Propofol allergy yielded several articles on the topic. While there have been quite a few cases reports of hypersensitivity and allergic reactions, the rate of anaphylaxis is fortunately quite rare, estimated at 1:60,000 exposures.[1] Propofol is an alkylphenol derivative (2,6-di-isopropylphenol) formulated as an oil-in-water emulsion using 2.25% glycerol, 1.2% purified egg lecithin, and 10% refined soybean oil.[2] Studies suggest that it is the isopropyl group and/or phenol ring that is allergenic, and not the lipid carrier.[2] Re-exposure to either of these two groups (whether it be from Propofol or some other drug), can lead to a minor or catastrophic allergic reaction. As is usually the case, our patient had no known allergies, nor had he been exposed to Propofol in the past.

Additionally, several authors have investigated the relationship between food allergies and Propofol, specifically egg, soybean, and peanut. There is no evidence to suggest any of these would elicit an allergic reaction, and many authors feel that Propofol can be safely administered regardless of history of food sensitization or allergy.[1,2]

Although our patient failed to exhibit symptoms of anaphylaxis, his allergy of unknown origin merited preparation for potentially more serious and even life-threatening reactions. The preparation of this patient included extensive coordination with all medical staff. Intravenous access had been established, and additional start kits and crystalloid were available to facilitate massive fluid resuscitation. Epinephrine was also prepared at 1:10,000 dilution, and this could be administered in IV pushes of 100-200mcg.[3,4] In the event that IV access was lost, intramuscular Epinephrine injection would also have been considered. Endotracheal intubation equipment was at the bedside, and delivery of 100% oxygen was also available. Hydrocortisone, Diphenhydramine, Albuterol, and Ranitidine were also ready to administer.

Additional risk exists when sedation is used for procedures in the Pain Clinic. Life threatening conditions such as anaphylaxis should be considered in these circumstances. Extensive training and preparation for such occurrences, though rare, could prove to be life-saving. We recommend having emergency medications and equipment readily available for such an instance. We also recommend routine inspection for expired medications, inadequate medication stock, or dysfunctional equipment.

Table 1 - **Treatment of Anaphylaxis**[3,4]

Discontinue offending drug or agent (if known)
Administer 100% Oxygen
Consider endotracheal intubation or advanced airway device
Albuterol administration
Epinephrine (10-500 mcg IV or IM) and consider vasopressor infusion
Intravenous fluid bolus (2-4L of crystalloid)
H_1 blocker (Diphenhydramine 50mg IV)
H_2 blocker (Ranitidine 150mg IV)
Corticosteroid (Hydrocortisone 200mg IV or Methylprednisolone 125mg IV)

1. Asserhoj LL, Mosbech H, Kroigaard M, Garvey LH. No evidence for contraindications to the use of propofol in adults allergic to egg, soy or peanut. *Br J Anaesth*. 2016 Jan;116(1):77-82.
2. Dewachter P, Kopac P, Laguna JL, et al. Anaesthetic management of patients with pre-existing allergic conditions: a narrative review. *Br J Anaesth*. 2019 Jul;123(1):e65-e81.
3. Butterworth JF, Mackey DC, Wasnick JD (Eds.). (2014). *Morgan & Mikhail's clinical anesthesiology*. New York, NY: Lange Medical Books/McGraw Hill. Pp.1217-1222.
4. Stanford Anesthesia Cognitive Aid Group*. Emergency Manual: Cognitive aids for perioperative critical events. See http://emergencymanual.stanford.edu for latest version. Creative Commons BY-NC-ND. 2016 (Version 3).

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