

Papaverine chloride as a topical vasodilator in accidental injection of adrenaline into a digital finger

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Keywords: accidental injection; adrenaline (epinephrine); EpiPen; papaverine.

Auto-injector of adrenaline is prescribed widely for self-intramuscular administration in case of anaphylaxis. An increasing trend in accidental injection cases into digits has been observed within the last years with the frequent use of adrenaline auto-injectors (1). This is an annoying situation with pain and possesses a potential risk of tissue necrosis in the victims. Different treatment options have been described to relieve symptoms related with this problem (1).

A 20-year-old female laboratory technician punctured her right thumb accidentally, while handling an auto-injector of adrenaline belonging to a patient (EpiPen USP; 1 : 1000; 0.3 ml [Dey, Napa, CA, USA]). A total amount of 0.3 ml of strength 1 : 1000 (1 mg/ml) adrenaline was injected. A puncture wound was noted on her right thumb just next to her interphalangeal joint. Her finger was cold and pale, and she suffered from pain (Fig. 1).

Papaverine for accidental epinephrine auto-injection.

Capillary refill time was delayed to 5 s. Restoration of blood flow by immersion in warm water was attempted unsuccessfully. Papaverine chloride (Papaverin HCl 20 mg/ml; Galenilac, Istanbul, Turkey) was diluted (20 mg in 10 ml of saline) and embedded into a sponge. The sponge was placed around the right thumb, and it was wrapped with bandage for 3 h. The finger turned to normal appearance and was warm and pain-free with normal capillary refill time. Full recovery was noted at the end of 3 h without any disability, except for the local tenderness.

There is no reported case of digital loss with adrenaline auto-injector; however, severe pain and discomfort with the possible local tissue ischemia need to be treated emergently. Immersion into warm water, digital massage, and application of topical nitroglycerin are announced to be conservative applications with a wide acceptance (2). Because adrenaline induces a vasocon-

striction through an α -adrenergic effect, the use of topical phentolamine, which is a nonselective α -adrenergic antagonist, is very effective in patients unresponsive to the conservative treatment mentioned earlier. Local injection of phentolamine to the area can reverse ischemia quickly and efficiently (1). However, because of limited space in the accidental injection area, additional volumes of phentolamine may cause a possible compartment syndrome, which may worsen ischemia by extra induced pressure (3). Spontaneous reversal of circulation after adrenaline injection has been also reported (1, 3). Mrvos et al. (3) reported that only 50% of patients with accidental injection into digits ($n = 23$) admit emergency departments. Among those, 86% of them were managed with conservative therapy, in which very few of them ($n = 2$) required treatment with phentolamine. All patients recovered uneventfully. As phentolamine is not available in many



Figure 1 Pale and delay capillary refill time of the right thumb after injection of adrenaline auto-injection.

emergency departments and because of most patients with accidental auto-injection into digit improved spontaneously, use of conservative therapy such as local papaverine may be beneficial in relieving ischemia.

Papaverine is an opiate, act as smooth muscle relaxant, which inhibits phosphodiesterase enzyme, and it is widely used during or after vascular surgeries to reverse vasospasm (4). It can also be used in the treatment of spasms of the gastrointestinal tract, bile duct, ureter orally, and/or parenterally (4). In addition to parenteral route, topical application of papaverine is also effective in patients with erectile dysfunction (5).

Intravenous administration of papaverine has a rapid onset of action with a half-life of 100 min. It is considered as a safe drug (4), with rare complications such as hypotension, arrhythmia, hyperthermia, constipation, hepatitis, areflexia, and metabolic acidosis (6). On the other hand, topical papaverine gel appears to be safe and well tolerated after application (5). Despite the conservative treat-

ment options or unavailability of adrenergic agents, papaverine may be used as an alternative choice for the quick relief of pain and possible tissue ischemia induced by accidental epinephrine auto-injection cases.

Authors thank the laboratory technician Ms. O.Y. for her permission for visualizing the injected finger.

Contribution: We confirm that each named author contributed to the manuscript.

We confirm that there is no conflict of interest.

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Accepted for publication 14 May 2011
Allergy 2011
© 2011 John Wiley & Sons A/S
DOI: 10.1111/j.1398-9995.2011.02664.x

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