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Original Research

Assessment of efficacy of intraosseous injection in addition to conventional local anesthetic techniques in Endodontics

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***ABSTRACT*:)**

Background: The present study was conducted to assess efficacy of intraosseous injection in addition to conventional local anesthetic techniques in Endodontics. **Materials & Methods:** The present study was conducted on 40 patients of both genders. Patients with mandibular molar with pulpalgia were selected. The number of patients with success and failure of inferior alveolar nerve block and intraosseous anesthesia were recorded. **Results:** Out of 40, males were 18 and females were 22. We found that with IAN technique there was 63.6% success rate and with X- tip technique 77.8%. The difference was significant (P< 0.05). **Conclusion:** Intraosseous injection can be a useful in addition of local anesthetic technique in patients with irreversible pulpitis.

Key words: Intraosseous injection, Local anesthesia, pulpalgia

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INTRODUCTION

Effective pain control during endodontic treatment is necessary to allow for patient comfort as well as to reduce operator stress. Although local anesthetics are highly effective in producing anesthesia in normal tissue, local anesthetics commonly fail in endodontic patients with inflamed tissue.[1] For instance, the inferior alveolar nerve (IAN) block is associated with a failure rate of 15% in patients with normal tissue, whereas IAN block fails 44-81% of the time in patients with irreversible pulpitis. Similarly, it has been reported that the failure rate of a maxillary infiltration injection is as high as 30% in teeth with irreversible pulpitis.[2]

The intraosseous injection allows placement of a local anesthetic solution directly into the cancellous bone adjacent to the tooth to be anesthetized. Because infiltration injections with lidocaine solutions are not effective for anesthesia of the mandibular molar teeth due to the thickness of the cortical plate, dentists do not attempt infiltration anesthesia in the posterior mandible. The intraosseous injection overcomes this problem by allowing direct access to the cancellous bone.[3]

There are two intraosseous systems that have been studied clinically- the Stabident system and the X-tip system. Recently, two other anesthetic systems have been introduced—the IntraFlow and the Comfort Control Syringe.[4] The IntraFlow system combines a slow-speed handpiece with an anesthetic cartridge dispenser system and a rotating needle/drill. The anesthetic solution is delivered after the cortical bone is perforated.[5] The present study was conducted to assess efficacy of intraosseous injection in addition to conventional local anesthetic techniques in Endodontics.

MATERIALS & METHODS

The present study was conducted in the department of Endodontics. It comprised of 40 patients of both genders. Patients with mandibular molar with pulpalgia were selected. The study was approved from institutional ethical

committee. Patients were informed and written consent was obtained.

Data regarding name, age, gender etc. was recorded. Patients received inferior alveolar nerve blocks using 4% articaine with 1:100,000 epinephrine. After ensuring the subjective and objective signs of anesthesia in all the patients, the mandibular molar tooth was isolated with a rubber dam and the access cavity preparation was started. Patients were instructed to rate any discomfort during access using a Heft-Parker visual analogue scale (HP VAS). 18 out of 40 patients had moderate or severe pain on access into dentin, when entering the pulp chamber or with initial file placement, and received a supplemental intraosseous X-tip injection using 4% articaine containing 1:100,000 epinephrine. The number of patients with success and failure of inferior alveolar nerve block and intraosseous anesthesia were recorded. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Total- 40		
Gender	**Males**	**Females**
Number	18	22

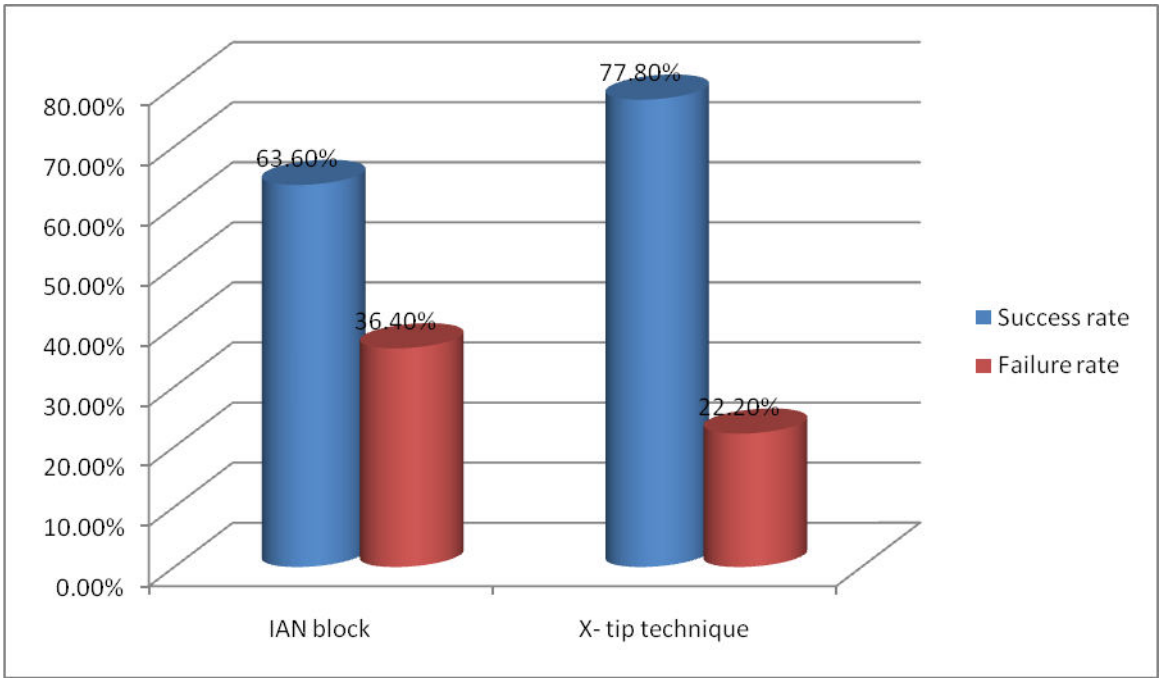
Table I shows that out of 40, males were 18 and females were 22.

Table II Assessment of anesthetic success

Anesthetic technique	Success	Failure	P value
	14/22 (63.6%)	8/22 (36.4%)	0.01
X- tip technique	14/18 (77.8%)	4/18 (22.2%)	

Table II, graph I shows that with IAN technique there was 63.6% success rate and with X- tip technique 77.8%. The difference was significant (P< 0.05).

Graph I Assessment of anesthetic success



DISCUSSION

The X-tip anesthesia delivery system consists of an X-tip that separates into two parts: the drill and guide sleeve component. The drill leads the guide sleeve through the cortical plate, whereupon it is separated and withdrawn. The remaining guide sleeve is designed to accept a 27-gauge needle to inject the anesthetic solution. The guide sleeve is removed after the intraosseous injection is complete.[6] The technique of intraosseous anesthesia, using the Stabident or X-tip systems, can be reviewed in their respective instruction manuals and/or published papers. Supplemental injections are essential in patients with irreversible pulpitis when pulpal anesthesia from Inferior alveolar nerve block is inadequate. Traditionally, solutions of lidocaine or mepivacaine have been administered with the intraosseous injection.[7] The present study was conducted to assess efficacy of intaosseous injection in addition to conventional local anesthetic techniques in Endodontics.

In present study, out of 40, males were 18 and females were 22. We observed that with IAN technique there was 63.6% success rate and with X- tip technique was 77.8%. The failure rate with IAN was 36.4% and with X- tip technique was 22.2%.

Kanaa et al[8] conducted a study using intraosseous injection system by name X-tip to evaluate its effectiveness in cases where inferior alveolar nerve block has failed to provide pulpal anesthesia.

Sixty adult patients selected were to undergo endodontic treatment for a mandibular molar tooth. Inferior alveolar nerve block was given using 4% articaine with 1:100,000 epinephrine. Twenty-four patients (40%) had pain even after administration of IAN block; intraosseous injection was administered using 4% articaine containing 1:100,000 epinephrine, using the X-tip system. The success of X-tip intraosseous injection was defined as none or mild pain (Heft-Parker visual analog scale ratings $\leq$ 54 mm) on endodontic access or initial instrumentation. Intraosseous injection technique was successful in 21 out of 24 patients (87.5%), except three patients who had pain even after supplemental X-tip injection.

Nusstein et al[9] conducted a study found that a supplemental mandibular intraosseous injection using the Stabident system and 1.8 ml of 2% lidocaine with 1:100,000 epinephrine was 91% successful in gaining total pulpal anesthesia for posterior teeth diagnosed with irreversible pulpitis. Dunbar et al[10] used the Stabident intraosseous injection in patients with irreversible pulpitis when conventional local anesthetic techniques failed. They found an initial supplemental intraosseous injection, using 0.45 to 0.9 mL of 2% lidocaine with 1:100,000 epinephrine, was successful in 79% of posterior mandibular teeth.

CONCLUSION

Authors found that intraosseous injection can be a useful in addition of local anesthetic technique in patients with irreversible pulpitis.

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