Clinical Significance

Imaging protocol parameters can affect the accuracy and quality of the images obtained by any imaging system. CBCT can also be less accurate in the hands of people who aren't well versed in the uses and techniques of CBCT. Further studies, particularly in vivo investigations, are needed, but CBCT appears to be the best imaging technique for evaluating infrabony defects, alveolar bone crest height, furcation lesions, and periodontal ligament space.

various imaging approaches. Overall, it appears that for the specific instances evaluated in this review, CBCT is more accurate and reliable than 2-dimensional conventional imaging techniques.

Choi IGG, Cortes ARG, Arita ES, et al: Comparison of conventional imaging techniques and CBCT for periodontal evaluation: A systematic review. *Imaging Sci Dent* 48:79-86, 2018

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PULP INJURY

Biodentine

BACKGROUND

Vital pulp therapy (VTP) has been recommended for the treatment of reversible pulpitis and proved itself an attractive option, conserving the defense mechanisms of the pulp and enabling dentin formation. Evidence is now indicating that it may be a useful intervention regardless of whether the patient's clinical signs and symptoms suggest reversible or irreversible pulpitis. Mineral trioxide aggregate (MTA) is an alkaline material that stimulates dentin bridge formation and offers both good sealing ability and biocompatibility. Its use in VPT has been highly successful, but it has the drawbacks of discoloring teeth, requiring a long setting time, and being more expensive. Biodentine (BD) is a calcium silicate–based material that has the same clinical applications as MTA but is associated with better physicochemical properties, micromechanical anchorage, no tooth discoloration, a fast setting time, and ease in handling. Long-term studies are not available for BD because it's relatively new as a capping material in mature permanent teeth. A comparison was done of VPT with MTA or BD to evaluate the clinical successfulness of the 2 materials in adults.

METHODS

Sixty-eight patients (mean age 32.5 years, range 16 to 51 years) with 68 vital permanent teeth with deep caries were randomly assigned to treatment with BD or MTA. A complete examination was performed, including radiographs, before the procedure. Local anesthesia was used for the caries excavation. After pulp exposure, hemostasis was obtained using sodium hypochlorite, then the teeth were capped with BD or MTA. Follow-up examinations, including radiographs, were done after 6 months and 1, 2, and 3 years.

RESULTS

Most of the patients reported moderate pain preoperatively. One week after the procedure, 7 patients had postoperative discomfort with mild cold sensitivity.

At 6 months, 4 failures occurred, with each patient having reported severe pain the second day after having a pulpotomy. A 100% success rate was achieved with all other treatments, for an overall success rate of 93.3%.

At 1 year, 1 tooth had experienced a broken coronal restoration and pulp exposure and was excluded. In addition, 1 BD-treated tooth had a large periapical lesion and was considered unsuccessful. Two patients did not participate in the follow-up. Overall success rate at this point was 98%.

At 2 years, all the teeth were both clinical and radiographic successes, although 1 patient did not participate in the follow-up. At 3 years, 1 patient had a fractured tooth and 1 did not attend the follow-up examination. The BD group had 2 failed cases and the MTA group had 1. All of the teeth treated with MTA had some discoloration, but none of the BD teeth did. There was neither canal obliteration nor a dentin bridge seen radiographically. The success rate overall was 93.8%, with a rate of 91.7% for BD and 96.0% for MTA. The difference was not statistically significant.

DISCUSSION

Both BD and MTA offer good success rates when used as direct pulp capping material or pulpotomy material in permanent

Clinical Significance

MTA offers good clinical properties when used as pulp capping material and has been the material of choice for some time. The ability of BD to overcome the drawbacks associated with MTA and still achieve high success rates makes it an extremely attractive option. Larger randomized clinical trials with a longer period of follow-up are needed to refine and clarify the most appropriate clinical guidelines for using BD.

mature teeth with caries. Their success rates were not significantly different, and both would be valuable for use in VPT.

Awawdeh L, Al-Qudah A, Hamouri H, et al: Outcomes of vital pulp therapy using mineral trioxide aggregate or biodentine: A prospective randomized clinical trial. *J Endod* 44:1603-1609, 2018

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RESTORATIVE DENTISTRY

Longevity of minimally invasive alternatives

BACKGROUND

When addressing a defective restoration in a permanent tooth, replacement is the method most widely used. This approach includes complete removal of the direct restoration and replacement with a restorative material. To counter some of the adverse aspects of this approach, minimally invasive strategies, including repair, sealing, and refurbishment, have been proposed as alternatives. A comparison of the longevity of restorations managed using the removal method or using a minimally invasive alternative was done.

METHODS

The MEDLINE via PubMed, Cochrane Library, Web of Science, Scopus, BVS – Latin American and Caribbean Literature in Health Sciences (LILACS), and the Brazilian Library of Dentistry (BBO) and Open Gray databases were searched. The review included both controlled clinical trials (CCTs) and randomized clinical trials (RCTs) that assessed the clinical characteristics of restorations after replacement with either direct restorations in amalgam or composite resin without cusp involvement and those managed with minimally invasive techniques. Ten articles met the criteria, with 8 found through the initial search and 2 from a manual search of the references of the articles. None of the studies included patients at high risk for caries. Follow-up ranged from 2 to 12 years, and the number of direct restorations for subgroups was between 7 and 73.

RESULTS

The clinical characteristics evaluated in most studies were marginal adaptation, surface roughness, anatomical form, marginal pigmentation, and secondary caries. Whether replacement or minimally invasive techniques were used, the longevity of the restorations was comparable. This included the use of composite resin or amalgam. Additionally, refurbishment was shown to be a useful method for managing localized anatomical form defects.

When the clinicians in the studies were compared, it was found that dentists prefer to replace direct restorations, especially if they did not originally place it. If the dentist who performed the primary technique is called to manage a failed restoration, he or she tends to choose to repair it. Dentists are more likely to choose to repair rather than replace direct restorations in molars compared to premolars and anterior teeth.

Clinicians who work in solo practices or with a multidisciplinary team are more likely to prefer direct restorations over repair. Those in public health practices tend to select repair. Private practice dentists also choose replacement when the direct restoration is in dentin and prefer composite resin over amalgam for the repair or replacement of direct restorations.

Patients will pay less for repairs than for complete replacements of composite resin restorations. Amalgam restoration repair tends to be more expensive.

DISCUSSION

Most restorations fail several years after primary treatment. Failure is usually caused by secondary caries, marginal fracture of the restoration, tooth or restoration discoloration, or degradation of the tooth or restoration. The use of minimally invasive