

Use of SSC as Restorations on Permanent Dentition

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Background

- Stainless steel crowns (SSC) are referred to as preformed metal crowns used mainly to restore broken down pediatric teeth. These restorations acquire their retention from the prominent cervical 1/3rd bulge found in these teeth. Permanent SSCs obtain their retention in a similar way.
- These crowns are flexible enough to trim, crimp and shape to obtain a good fit by springing into and being retained by undercut areas.
- Indications for SSC are use following endodontic treatment, treatment of hypoplastic teeth, multi-surface caries, fractured teeth and useful in cases of bruxism and anterior tooth cross bite.
- Evidence supports the use of SSC as superior alternatives to class II amalgam or resin based restorations in primary teeth (Randall, 2002).
- Randall (2002) in his literature review found only one study that evaluated the clinical performance of SSC on permanent molars. Furthermore, search of the literature has revealed very few studies that have evaluated this topic in the literature.
- Much development from this topic has come from increased reporting on molar incisor hypomineralization which is a developmental defect involving one to four permanent first molars and often incisors.

Review of the Literature

- The CDA performed a retrospective chart review from 2006 to 2014 for permanent tooth pre-fabricated crown longevity. 155 SSCs were evaluated on permanent teeth as interim restorations on pediatric patients.
 - Of the 155 SSCs, 137 were found to be fully functioning (88% success rate) with an average service period of 45 months (CDA, 2017).
 - There was no comment on how long these crowns were followed up for
- Zagdwon et al (2003) compared SSC and NiCr cast crowns for restorations of permanent first molars with amelogenesis imperfecta or severe hypomineralized enamel defects (MIH).
 - 42 restorations were evaluated (19 SSC and 23 NiCr) for a mean duration of 17 months. 1 SSC and 2 NiCr failed during this time.
 - SSC proved to be a more cost-effective, and time saving, as well as less technique sensitive compared to NiCr.
 - There was no statistical difference found in success rates between the two types of restorations
- Case reports on SSC use in a pregnant and geriatric patient (Madhu, 2015)
 - 2 patients were included in this study and concluded that SSC were effective as interim restorations where reducing chair side time was an important consideration.
- A systematic review on SSCs for permanent teeth concluded that Permanent SSCs are viable interim restorations for permanent molars that have extensive breakdown from caries or developmental defects (Randall & Beale, 2015)

Indications for use – permanent molar teeth
1. Interim restorations of broken down or traumatized tooth until construction of a permanent tooth can be carried out
2. When finances are a concern; SSC can be used as a medium-term solution
3. Teeth with developmental defects where SSC can help restore occlusion and reduce sensitivity caused by enamel and dentin dysplasias in young patients
4. Restoration of a permanent molar that requires full coverage but has only partially erupted.

(Randall, 2002)

Critical Appraisal of Literature

- Very limited number of studies have studied SSC use in permanent teeth.
- Recommendations supporting use are based on weak study designs including several case reports, retrospective chart reviews, and one split-mouth study where there was no statistical difference found in the success/failure rate between two different preformed metal crowns.
- No studies were found comparing the clinical performance of SSC vs. gold standard definitive restorations i.e. gold crowns.
- Reduced cost and ease of preparation were cited as advantages of SSC; however, there is no quantification of how long these restorations can last
- Lead author for several studies on this topic is employed by 3M ESPE, a manufacturer of preformed metal crowns. This is a potential source of bias.
- Although studied heavily in the pediatric dentition, the longevity and prognosis of SSC in permanent teeth is still relatively unknown.

Summary

- For patients where reducing chair side time is an important consideration i.e. patients with disability, pregnancy, or geriatric population; SSCs have shown to be less technique sensitive and used to treat severe enamel defects or teeth with gross caries.
- In Ontario, public insurance compensates for SSC; hence, for patients with financial concerns, SSCs can offer patients a viable semi-permanent restoration.
- Despite the challenges of having poor aesthetics, experiencing recurrent decay, and their ongoing maintenance, SSC continue to offer the advantage of full-coverage restorations
- SSCs should be considered as an alternative to more precise crown fabrication techniques until further research can comment on the prognosis of such restorations in the permanent dentition

References

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