Recent trends of Esthetics crown in Pediatric Dentistry

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ABSTRACT: Loss of anterior enamel in youngsters can result in hampered esthetics, Speech disruption, increase parafunctional habits, and mental difficulties are all symptoms of a neuromuscular imbalance with diminished masticatory efficiency. With the developing consciousness of the esthetic alternatives available, there's a greater demand for answers to unpleasant troubles including caries, discoloured enamel, hypoplastic defects, fractures, and lacking enamel in youngsters. However, the most important quandary is selecting the pleasant remedy modality for a selected affected person and situation. The latest advances in anterior crowns in pediatricesthetic dentistry long side their indications, advantages and disadvantages.

I.INTRODUCTION: Premature loss of teeth, which is very common in children due to lack of knowledge about oral hygiene procedures and negligence for maintaining dental health, can impede God's gift of teeth to children. As a result, primary tooth maintenance is required. However, most parents ignore these concerns, resulting in difficulties eating, making social interactions, and communicating. Despite the fact that primary teeth are transitory dentition, they should be kept in a healthy state in the oral cavity until they are exfoliated.[1]
A goal of aesthetic dentistry is to produce a smile that is "bright, beautiful, but believable."
Today there are numerous answers to be had for cultured problems in Pediatric Dentistry. But the largest predicament is deciding on the exceptional remedy modality for a selected affected person and situation which relies upon on different factors just like the age of the affected person, motivation of the parents, the child`s conduct within side the dental clinic, and the socio-financial repute of the affected person. Early restorations normally covered placement of stainless-steel crowns (SSCs) or bands on critically decayed enamel. They were unesthetic and their use changed into constrained to posterior enamel. Esthetic complete restorations are to be had for anterior and posterior number one enamel, which maintain the capabilities of number one enamel till their exfoliation in robust state.[2-3]

II. History:[4]
1950—Engel introduce the stainless steel crown (SSC) and Willium Humphrey promoted it in paediatric dentistry.
1971—Mink and Hill introduce SSC modification
1980 to 1990—Preveneered stainless steel crowns (PVSSC) were discovered
1987—Peter Cheng introduce Cheng crowns
1997—Zirlock (Incisalock) technology was introduced
2010—Hansen JP and Fisher JP introduced EZ zirconia crown

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III. GeneralConsiderations:[4]
Importance of primary teeth:
Crown may be used on primary teeth in order to:

- Preserve the primary teeth until exfoliation
- Maintain masticatory function
- Maintain esthetic function
- Help in speech
- Space management

IV.Different crowns used in Pediatric Dentistry:[4]
Based on Material Used
• **All metallic crown**
a. Stainless steel crown (SSC/PMC)
b. Aluminum crown
• **Stainless steel crowns (SSC) with facing**
• **Preveneered stainless steel crown:**
a. Cheng crown
b. Dura crown
c. Kinder krown
d. NuSmile crown
e. Pedo pearls
• **Resinous/composite crown**
a. Strip crown
b. Artglass crown
c. Figaro crown
d. Composite shell crown
e. New millennium crown
f. Glass ionomer crown
g. Polycarbonate crown
h. Pedo jacket crown
• **Ceramic (Zirconia) crown**
a. ZIRKIZ crown
b. EZ-crown
c. Kinder Krown
d. CEREC crown
• **Biologic crowns**

V. DISCRIPTION:
Stainless Steel Crown[5]**:**Inexpensive and easy at restoring extremely carious and fractured incisors.Easy to deploy and resistant to breakage. Wearuntil it is stable and firmly attached to the teeth but theycompromiseaesthetics due to metallic silver.

Stainless-Steel Crowns modifications:[5]
a. Stainless steel facing crowns: In labial surface composite is placed in SSC and the process is very time consuming, metallic margins are little evident.
Advantages:
1. Cost efficient
2. Sturdy
3. Simple to use
4. Well-suited to teeth
5. Aesthetically attractive
Disadvantages:
1. Metal appearance at gingival margin of the crown
2. Isolation problem
3. Chairside time increases

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QueisH et al.[6] in **2010** done a study in anterior veneered stainless steel crown in pediatirc dentist and inference that anterior veneered stainless steel crown is commonly used to treat primary teeth.

b. Pre-Veneered Stainless steel crowns[7]: The metal is bonded to the composite resins and thermoplastics.
Steps of Preveneered Crown Placement:

1. The first step is to estimate the crown size.
2. Then 1-1.5mm incisal reduction.
3. 1.5mmproximal reduction.
4. Preparation should be a feather edge and extend slightly subgingivally.
5. Upon try-in, the crown should be passively fit.
6. Prepare and adjust the tooth rather than adjusting the crown to fit the tooth.
7. Cementation of crown can be done with a glass ionomer cement.

Cheng Crowns[8]: Cheng Crownswas introduced in 1987. It is best for people who is searching Stain-resistant Crowns.It's available in standard lengths and sizes for centrals, laterals, and cuspids. They can be heat sterilised without losing their bond strength or colour.It is available in upper and lower – right and left – as well as lateral, in six sizes.

Advantages:

1. Single visit
2. Most acceptable crowns
3. Autoclavable
4. Cost effective
5. Stain resistant
6. Does not induce opposing tooth wear

Disadvantages: It may fracture while crimping

Dura crowns[8]: These crowns can be crimped labially and lingually, trimmed with crown scissors, festooned without difficulty. Have a full-knife edge.The veneered crowns were shown to be much more retentive than the non-veneered crowns.

Kinder krowns[1]: These crown provide the maximum natural shade and contour for pediatric patient. In this crown composites give the illusion of a genuine smile without the bulky "Chiclet" appearance of other restorations.Two shades are available in Pedo 1 and Pedo 2.The Pedo 2 color is most natural color.Pedo 1 colour is for those cases where a bleached white colour is required.Incisal Lock^{TM}feature, the most advanced combination of state-of-the-art bonding techniques and mechanical retention.

Nu Smile crowns[9]: NuSmile crowns have the most natural appearance.Heat sterilisation has no effect on the bond strength or colour on these crowns.It is available in 2 sizes i.e ordinary and big for centrals, laterals and canines. These are best at labial side, it permit crimping best at palatal side.

Advantages:

1. Natural looking crowns
2. Autoclavable
3. Aesthetics
4. Longer life span

Disadvantages:

1. Poor gingival health
2. Costly
3. Bulky
4. Fractures can result through crimping.

NuSmile Crown is Available in Two Forms

1. NuSmile signature.
2. NuSmile ZR.

NuSmile Signature Crowns: They are stainless steel crowns with a tooth-colored finish that are anatomically correct.

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NuSmile ZR Crowns: Houston, Texas–NuSmile pediatric crowns has introduced NuSmile ZR. These are made from zirconia ceramic.NuSmile® zirconia crowns are comprised from monolithic zirconia and are look like ceramic steel while replicating the anatomical features of normal primary teeth for a natural clinical result.[4]
Queis H et al.[6]in**2010**done a study to assess the use of anterior esthetic stainless steel crown (AVSSC) among pediatric dentist by questionnaire survey on 2600 AAPD members. It was found that NuSmile crown used more among PVSSC that is 61 percent NuSmile, 28 percent Cheng crown, 35 percent Kinder krowns.

Pedo Pearls[8]: These are heavy-gauge metal crowns with FDA-approved powder coating and made from epoxy-resin.Anatomy is universal-may be used both sides. Easy to crimp. The crowns are very soft, and there is far less sturdiness.

Strip crowns[9]: It is the most popular and visually aesthetic of all the primary incisor repairs.These crowns are with composite resin and are bonded to the tooth.
Benefits:
a. Most parents and patients are delighted
b. Quick to fit & trim
c. Quick and easy removal
d. Easy shade control with composite
e. Crystal transparent and thin
Indications:
1. After pulp therapy
2. Hypoplastic teeth
3. Amelogenesis imperfecta
4. Discolored teeth
5. Interproximal caries,
6. Multisurface caries
Contraindications:
1. Insufficient tooth structure for retention
2. Deep overbite
3. Patient with parafunctional habits
4. Periodontal infections

Radu F et al.[10]in **2015** conducted a study on clinical performance of strip crowns and concluded that the use of strip crowns to restore the incisors is simple, even if there is little tissue left after preparations, and the results are pleasing.

Artglass crowns[11]: Artglass crowns, also called as Glastech crowns, are constructed of art glass, a polymer glass used to restore anterior primary teeth. It's a novel type of multifunctional methacrylate that can build 3-D molecular networks with a strongly cross-linked structure. Microglass and silica are used as filler materials, giving them higher durability and aesthetics than strip crowns. It provides the bondability and feel of composites while also providing the longevity and aesthetics of porcelains.

Figaro crowns[12,13]: Figaro crowns are a new addition to the list of aesthetic crowns that can be used in children. Fiberglass or quartz filaments/fibers are embedded in composite resin.T hese crowns are mimic like a real tooth. While zirconia and SSC are limited in their ability to mirror the shape of the tooth and are more in to mountains and valleys, the Figaro crown embraces the genuine anatomy of the tooth, resulting in an aesthetically pleasing finish with cusps and grooves**.** Grinding and eccentric occlusion adjustments are all possible with Figaro crowns.

Zirconia crowns[14,15]: John P Hansen & Jeffery P Fisher in 2013 proposed zirconia crowns. Zirconia is a white crystalline form of zirconium dioxide.The yttrium-oxide-partially-stabilized zirconia (3Y-TZP) in particular exhibits mechanical properties similar to those of metals but a hue identical to teeth. The most common synthetic zirconia crowns are EZ crowns. As, anterior and posterior crowns, EZ Pedo Company introduced monolith zirconia pedo crowns. They're made of a robust enamel-colored material that looks extremely aesthetic from the front as well as within the mouth.

Alaki SM et al.[16] in **2020** done a comparative study between zirconia and strip crown in anterior primary teeth and concluded that zirconia crown shows better gingival, less plaque accumulation as well as loss of crown material.

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Acc. to **Alzanbaqi SD et al**.[17] in **2022** conducted a study in survival of zirconia crown and they inference that zirconia crowns has a higher success rate after pulp therapy and fail in those cases without pulp therapy.

Talekar AL et al.[18] in **2021** was done comparative study between zirconia crowns and glass fibre composite crown in primary teeth and concluded that zirconia crowns are highly acceptable and better than clinical performance than glass fibre reinforced crown after 18 months.

Cerec crowns – All ceramic crowns[4]: Cerec crowns is made from using CAD/CAM technology. A virtual image of enamel is taken,then it is converted into a 3-D automated version of enamel, which is used as a model for crown manufacture.The ceramic blocks come in a variety of shades and colours, and they're custom-made to match the neighbouring teeth.

Advantages:

1. Single visit
2. Time savings
3. No need for temporary crown
4. Esthetics
5. Long lasting

Disadvantages:

1. Costly
2. Requires further training for the dentist to understand the technology.

Biologic crowns[4]: This crown form from reattaching the tooth fragments with real teeth.It satisfies the visual and functional requirements of natural teeth.**Chosak**and **Eildeman** published the first case report on this method in **1964**.They're produced from real tooth fragments. Dual cure composite is used to attached the tooth fragment.

Benefits:

1. Esthetics
2. Eliminates the need for a lengthy clinical visit
3. Eliminates the need for time-consuming procedures
4. Cost-effective

Indra MD et al.[19] in **2014** done a study in biologic restoration and concluded that biologic crown over composite post provide more success rate and the child and parents are satisfied with the treatment outcomes.

VI. Instruction given after crown delivery:[4]

Discomfort or sensitivity: As the anaesthetic wears off, a newly crowned tooth may be sensitive just after the treatment. Biting pain or sensitivity is frequently caused by a crown that is too high on the tooth.

Chipped crown: Crowns made entirely of porcelain or SSC with a facing are prone to chipping. If the damage is little, it can be repaired using a composite resin and the crown.

Loose crown: The crown's cement can wash out at times. Not only does this allow the crown to loosen, but it also allows bacteria to enter the tooth and cause decay.

Tooth exfoliation: Crowned teeth exfoliate in the same way that uncrowned teeth do.

Crowns falls off: Crowns can come loose at any time. This is usually caused by an incorrect fit, a shortage of cement, or a small piece of tooth structure remaining.

VII.Complications after crown delivery:[4]

- Aspiration of crown
- Allergic reaction
- Gum irritation
- Recession
- Sensitivity

VIII.CONCLUSION:

For recovering the primary anterior teeth, the pedodontist has a large selection of beautiful crowns. So, the introduction of newer materials, dentistry in the modern period is highly dependent on aesthetic principles. We should make every effort to accommodate these requests while also taking into account the socioeconomic position of the patients. It's important to remember that aesthetics in juvenile dentistry serves as the foundation

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for adult aesthetics and will soon become a big topic. It's necessary to remember that aesthetics harmony can boost psychological wellness and reduce peer pressure.

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