

Dental Bridge Procedure to Straighten Loose Teeth, A Review

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ARTICLE INFO : Received, December 20, 2022; Revised, March 19, 2023; Accepted, April 25, 2023; Published June 20, 2023
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DOI : xxxx-xxxx-xxxx

ABSTRACT

Background: A dental bridge is a treatment that fills spaces or gaps between teeth or fills in missing teeth. Bridges can help restore bite and maintain the natural shape of the face. The procedure for closing or making abutments between the gaping tooth spaces uses dentures (called pontics). **Objective:** Report and explain the dental bridge process to straighten loose teeth. **Materials and Methods:** Based on the author's knowledge, this review included theory or case studies from Elsevier, Willey, MDPI, Hindawi Publishing, Dove Press, and Pubmed journals. Several (35 articles) of these manuscripts are then identified for appropriateness with the subjects provided in this study, assessed descriptively, and described based on the manuscript's flow or scientific principles. **Results:** Pontics are made of porcelain to match the natural color of the teeth. After the pontic is implanted, there is no more space between the teeth. In general, this procedure is needed to: Restore the teeth's ability to bite and chew, Clarify speech when you speak, Maintain facial shape, and Prevent remaining teeth from falling out or shifting positions. Four types of dental bridges are an option to "bridge" the empty dental space: Traditional bridge, Cantilever bridge, Maryland bridge, and Implant-supported dental bridge. Pontic installation through this process must be repeated every 5-15 years, depending on the type of treatment. This paper reports several types of dental bridges that can be used as references to improve understanding of prosthodontics. **Conclusion:** A dental bridge uses dentures anchored to teeth or implants to replace lost teeth permanently, improving speech, restoring a smile, and preventing tooth loss.

Keywords: Dental bridge, Dentures, Pontics, Straighten Loose

ABSTRAK

Latar belakang: Jembatan adalah perawatan yang mengisi ruang atau celah antar gigi atau menambal gigi yang hilang. Jembatan dapat membantu memulihkan gigitan dan mempertahankan bentuk alami wajah. Prosedur penutupan atau pembuatan abutmen di antara ruang gigi yang menganga menggunakan gigi palsu (disebut pontik). **Tujuan:** Melaporkan dan menjelaskan prosedur pemasangan jembatan gigi untuk meluruskan gigi yang goyah. **Materi dan Metode:** Berdasarkan pengetahuan penulis, ulasan ini mencakup teori atau studi kasus dari jurnal Elsevier, Willey, MDPI, Hindawi Publishing, Dove Press, dan Pubmed. Beberapa (35 artikel) dari naskah-naskah tersebut kemudian diidentifikasi kesesuaiannya dengan pokok bahasan yang diberikan dalam penelitian ini, dinilai secara deskriptif, dan dideskripsikan berdasarkan alur naskah atau kaidah ilmiah. **Hasil:** Pontik dibuat dari porselen agar sesuai dengan warna alami gigi. Setelah pontik ditanamkan, tidak ada lagi ruang di antara gigi. Secara umum prosedur ini diperlukan untuk: Mengembalikan kemampuan gigi untuk menggigit dan mengunyah, Memperjelas ucapan saat berbicara, Menjaga bentuk wajah, dan Mencegah gigi yang tersisa rontok atau bergeser posisi. Empat jenis jembatan gigi adalah pilihan untuk "menjembatani" ruang gigi yang kosong: Jembatan tradisional, Jembatan kantilever, Jembatan Maryland, dan Jembatan gigi yang didukung implan. Pemasangan pontik melalui proses ini harus diulang setiap 5-15 tahun, tergantung jenis perawatannya. Makalah ini melaporkan beberapa jenis jembatan gigi yang dapat digunakan sebagai referensi untuk meningkatkan pemahaman prostodontik. **Kesimpulan:** Jembatan gigi (Dental bridge) menggunakan gigi palsu yang ditambatkan ke gigi atau implan untuk menggantikan gigi yang hilang secara permanen selain untuk meningkatkan ucapan, mengembalikan senyum, dan mencegah gigi lepas.

Kata kunci: Gigi Jembatan, Gigi tiruan, Meluruskan gigi, Pontik

1. Introduction

A dental bridge is a fixed dental restoration that replaces one or more missing teeth. It is called a bridge because it bridges the gap the missing tooth or teeth creates. The bridge is anchored to the adjacent teeth or dental implants and can be made from various materials, such as porcelain, ceramic, or metal.¹ The procedure for getting a dental bridge typically involves preparing the adjacent teeth by removing some of the enamel to make room for the bridge. Impressions of the prepared teeth and the gap are taken, then used to fabricate the bridge in a dental laboratory.² The bridge is then cemented onto the prepared teeth, filling the gap and restoring the patient's ability to chew and speak properly.³

Dental bridges are a standard and effective treatment option for patients with missing teeth, and they can last for many years with proper care and maintenance. Dental bridges are used to replace missing teeth and can provide several benefits.^{4,5} Here are some reasons dental bridges are used: Restore functionality: Dental bridges can restore the ability to chew and speak correctly, which can be difficult with missing teeth. Improve appearance: Dental bridges can fill in gaps left by missing teeth, improving the appearance of the smile and face. Prevent teeth from shifting: When a tooth is missing, the adjacent teeth can shift and cause alignment issues. Dental bridges can prevent this from happening by filling in the gap. Maintain facial structure: Missing teeth can cause the face to sag and make a person look older. Dental bridges can maintain the facial system and prevent these changes. Improve self-confidence: Missing teeth can impact a person's self-confidence and cause embarrassment.

Dental bridges can help restore self-confidence by improving the appearance of the smile. Dental bridges are a popular and effective option for patients with missing teeth who want to improve their oral health and appearance.^{6,7} The procedure for getting a dental bridge typically involves several steps and may require multiple visits to the dentist. Here is an overview of the dental bridge procedure: evaluation and preparation, impressions, temporary bridge, bridge fitting, final placement, and follow-up.⁸ This paper reports the method for using a dental bridge in dentistry and its application techniques

2. Material and Methods

The results of this review were obtained from some valid literature based on the author's expertise and compiled with theory or case reports from several journals published by Elsevier, Willey, MDPI, Hindawi Publishing, Dove Press, and Pubmed as library references. The findings in several (35 articles) of these manuscripts are then identified for suitability with the topics presented in this paper, then analyzed descriptively and described based on the flow or scientific principles written in this manuscript.

3. Result and Discussion

The Dental Bridge

Dental bridges are a common and effective dental restoration that replaces one or more missing teeth. Here is a brief overview of the theory and facts regarding dental bridges and their application (Fig 1). Theoretically, Dental bridges use adjacent teeth or dental implants as anchors to hold a false tooth or teeth in place. The bridge is typically made from durable and aesthetically pleasing materials, such as porcelain or ceramic, and is custom-made to fit the patient's mouth. The procedure involves preparing the adjacent teeth by removing enamel, taking impressions or digital scans, and fabricating the bridge in a dental laboratory.⁹ Once the bridge is ready, it is permanently cemented onto the prepared teeth, effectively filling the gap and restoring functionality and aesthetics.¹⁰

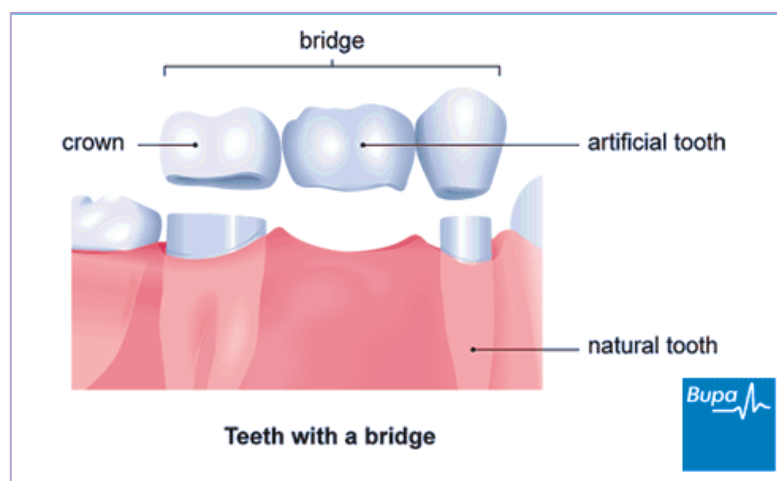


Figure 1. A dental bridge essentially bridges a gap in your mouth. A dental bridge is a prosthesis designed to replace one or more missing teeth by bridging the gap between the remaining teeth. The procedure entails the substitution of an absent tooth with a prosthetic tooth affixed to the adjacent natural teeth through bonding. There exist two primary classifications of dental bridges. The prevalent form of a dental prosthesis involves the utilization of two crowns, composed of porcelain or metal, that are affixed permanently to the adjacent natural teeth, with the artificial tooth (or teeth) situated in the intervening space. In cases where the adjacent teeth exhibit robust and sound dental structures, it is plausible to consider the possibility of an adhesive bridge as a viable treatment option for missing teeth. An adhesive bridge is a prosthetic dental appliance comprising a pontic tooth flanked by wings on either side, which is bonded to the adjacent teeth for support. The wings are affixed to the internal facets of the teeth providing support. This approach circumvents the necessity of performing preparatory measures on the adjacent teeth to place complete coverage dental crowns. (<https://www.bupa.co.uk/dental/dental-care/treatments/dental-bridges>)

Dental bridges have been used for many years to replace missing teeth and have a high success rate. They can improve the patient's ability to chew and speak correctly, prevent teeth from shifting, and improve the smile's appearance.¹¹ However, there are some limitations and considerations to remember, such as dental bridges requiring removing some enamel from the adjacent teeth, which can weaken them and make them more susceptible to decay or damage. Dental bridges are unsuitable for all patients, particularly those with significant tooth decay, gum disease, or jawbone loss.¹² Dental bridges may need to be replaced over time, particularly if the adjacent teeth or gums become damaged or compromised.¹³ Dental bridges are a valuable and effective dental restoration that can benefit patients with missing teeth. However, discussing the risks and benefits with a qualified dentist is essential to determine the proper treatment.¹⁴

The procedure of the Dental Bridge

The dental bridge procedure is relatively straightforward and can be completed in a few appointments. Dental bridges provide functional and aesthetic benefits with proper care and maintenance (Fig 2).

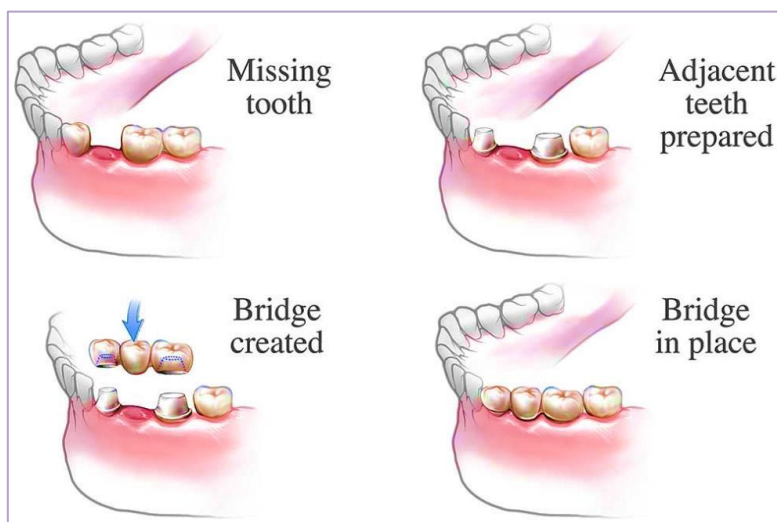


Figure 2. Dental bridge procedure. The dental bridge permanently replaces missing teeth with false teeth. The bridge is attached to the teeth on either side of the gap. Bridges are usually made of porcelain or metal, a mixture of the 2, or zirconia. They are fixed in place and, for some people, are an alternative to dentures (<https://www.healthdirect.gov.au/dental-bridge-procedure>)

The procedure for getting a dental bridge involves several steps and may require multiple visits to the dentist. Here is an overview of the dental bridge procedure.^{15, 16}

- a. Evaluation and preparation: The dentist will examine the patient's mouth and evaluate the condition of the adjacent teeth and gums. If the patient is a good candidate for a dental bridge, the adjacent teeth will be prepared by removing some of the enamel to make room for the bridge.
- b. Impressions: Impressions of the prepared teeth and the gap are taken, then used to fabricate the bridge in a dental laboratory. The dentist may also take digital scans of the teeth and gums using a 3D scanner.

- c. Temporary bridge: While the permanent bridge is being fabricated, the dentist may place a temporary bridge to protect the prepared teeth and fill the gap.
- d. Bridge fitting: Once the permanent bridge is ready, the dentist will remove the temporary bridge and check the fit of the new bridge. Any necessary adjustments will be made at this time.
- e. Final placement: Once the bridge fits properly, it will be permanently cemented onto the prepared teeth.
- f. Follow-up: The dentist may schedule a follow-up appointment to check the fit of the bridge and ensure that the patient is comfortable with it.

Important of dental bridges

It is important to note that dental bridges are not typically used to straighten loose teeth. Dental bridges require the adjacent teeth to be healthy and robust to support the bridge and hold it in place.¹⁷ If a patient has loose teeth, the dentist may recommend a different treatment option, depending on the cause of the problem. For example, if the teeth are flexible due to gum disease, the dentist may recommend deep cleaning or scaling and root planing to remove plaque and bacteria from the gums and teeth. In more severe cases, surgery may be necessary to repair or replace damaged gum tissue or bone.¹⁸ If the teeth are loose due to tooth decay or damage, the dentist may recommend a dental filling, crown, or other restoration to restore the tooth and prevent further damage.¹⁹

In some cases, orthodontic treatment, such as braces or clear aligners, may be necessary to straighten teeth and improve the bite.²⁰ However, this treatment option is typically used for teeth that are crooked or misaligned rather than loose. The treatment for loose teeth depends on the cause and severity of the problem and may require a combination of different dental procedures.²¹ It is essential to discuss any concerns or symptoms with a qualified dentist to determine the best course of treatment.²²

Type of Dental Bridge

Four main types of dental bridges are commonly used to replace missing teeth, each with advantages and disadvantages. The best option for each patient depends on factors such as the missing teeth' location, the adjacent teeth' condition, and the patient's overall oral health. Discussing the different options with a qualified dentist is essential to determine the most appropriate treatment plan for each case.^{23, 24}

- a. Traditional bridges: This type of bridge is the most common and involves using two adjacent teeth as anchors to hold a false tooth in place. The adjacent teeth are prepared by removing some enamel, and the bridge is cemented onto the prepared teeth.
- b. Cantilever bridges: This type of bridge is used when only one adjacent tooth is available to support the bridge. The false tooth is anchored to the adjacent tooth using a metal framework or bonding agent.
- c. Maryland bridges: This type of bridge involves bonding the false tooth to the back of the adjacent teeth using a metal or porcelain framework. It is a more conservative option as it does not require removing as much enamel from the adjacent teeth.
- d. Implant-supported bridges: This type of bridge involves using dental implants as anchors to hold the false tooth in place. The implants are surgically placed into the jawbone, and the bridge is attached to the implants using abutments.

Modern Dental Bridge Concept

Bridges often contain a combination of metals and porcelain or ceramics. The ceramic or porcelain is typically bonded to metal to improve the strength and functionality of the bridge.²⁵ Modern dental bridge concepts have improved significantly over the years. Computer-aided design and manufacturing (CAD/CAM) technology has revolutionized the process of designing and fabricating dental bridges, allowing for more accurate and precise bridge fitting.²⁶ Another modern dental bridge concept is using zirconia, a strong and durable ceramic material, as a bridge material. Zirconia bridges offer several advantages over traditional porcelain and metal bridges, including improved aesthetics, biocompatibility, and increased durability.²⁷

Implant-supported bridges have also become a popular modern dental bridge concept (Fig 3). These bridges are anchored to dental implants surgically placed into the jawbone, providing a more stable and long-lasting solution than traditional bridges. In addition, modern dental bridges can now be made using 3D printing technology, which allows for greater customization and precision in the design and fabrication process.^{28, 29} Current dental bridge concepts have improved aesthetics, functionality, and durability, providing patients with more options for restoring missing teeth and achieving a healthy, beautiful smile.³⁰

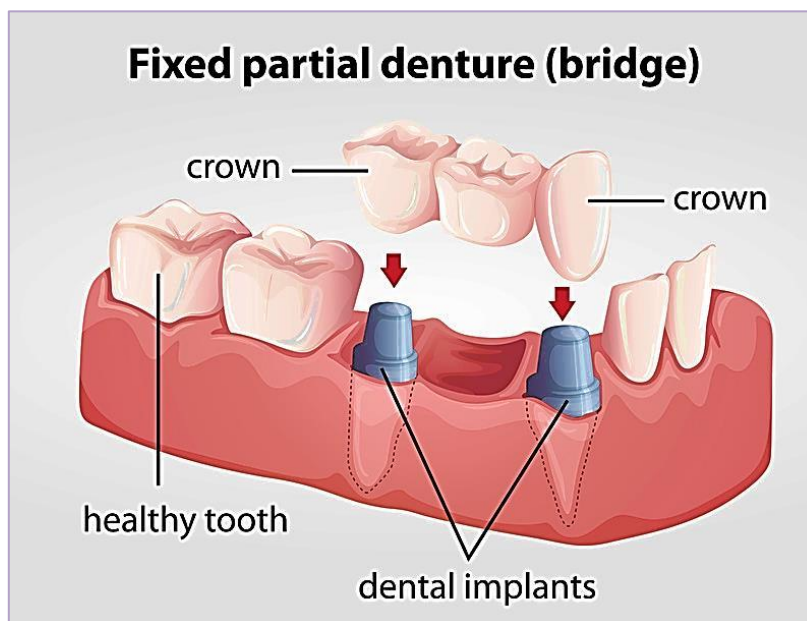


Figure 3. A dental bridge is used for teeth. It fills in gaps left by any missing teeth. The anchors for your bridge are the two teeth next to your missing tooth. The false tooth fills the hole in your bridge. The type of bridge you need depends on the number of teeth you are missing, the kind of bridge you need, and the location of your missing teeth.

Question and Answer of Dental Bridge

Could you please provide more context or information about the specific aspect of the dental bridge procedure you would like to know about?: A dental bridge is a restorative dental prosthesis that permanently replaces missing teeth with artificial teeth. The dental bridge is affixed to the adjacent teeth flanking the edentulous space. Bridges are commonly constructed using porcelain, metal, a combination of materials, or zirconia. They are immobile and serve as a substitute for dentures for specific individuals.³¹

Under what circumstances would a dental bridge be necessary?: A dental bridge may be required in cases where an individual has one or more missing teeth and possesses healthy teeth adjacent to the gap created by the absence of teeth. The dental bridge procedure involves the replacement of one or more missing teeth by anchoring a prosthetic tooth or teeth to the adjacent natural teeth or dental implants. Initially, the dental practitioner will conduct an oral examination to verify the presence of any dental caries or periodontal ailments and provide appropriate treatment. The dental practitioner may perform radiographic imaging and employ specialized instrumentation to obtain quantitative dentition and oral cavity data. In anticipation of a dental bridge, it is customary for the dental practitioner to reduce the two sound teeth flanking the space. Subsequently, a mold will be utilized to fabricate the bridge. In some instances, individuals may receive a provisional bridge as an interim solution while awaiting the fabrication of their definitive bridge. If that is the case, it is removed during the preparation of your permanent bridge. Once the permanent bridge is prepared, dental cement is affixed to the adjacent healthy teeth. Alternatively, the dental professional may secure the bridge using a dental implant, a surgical component inserted into the jaw. It will be necessary for the dentist to assess the suitability of dental implants for you.³²

What are the recommended methods for maintaining dental bridge hygiene?: It is recommended to utilize fluoride toothpaste and floss to clean the bridge, similar to the standard protocol for cleaning natural teeth. Frequent appointments with a dental professional are of significant importance.³³

What are the advantages and disadvantages of undergoing a dental bridge intervention?: Dental bridges are a viable option for individuals seeking to restore their smile and alleviate self-consciousness associated with tooth loss. The significance of replacing missing teeth is preventing adjacent teeth from shifting into the gap, which can ultimately alter an individual's occlusion. With proper maintenance, bridges have the potential to endure for extended periods. Nonetheless, dental implants may experience failure, commonly attributed to the deterioration of adjacent natural teeth or the breakdown of the cement utilized in the implantation process.³⁴

What are the alternative options to dental bridges?: The direct substitute for a dental bridge entails the utilization of detachable prosthetic teeth, commonly referred to as partial dentures, which can be removed for cleaning. A dental implant presents itself as an additional option.³⁵

4. Conclusion

In conclusion, a dental bridge is a permanent solution to replace missing teeth, using false teeth anchored to adjacent teeth or dental implants. It can restore the function and appearance of the smile, improve speech, and prevent other teeth from shifting out of place. Different types of dental bridges are available, and the most suitable option depends on individual factors such as the missing teeth' location, the surrounding teeth' condition, and the patient's overall oral health. Working with a qualified dentist to determine if a dental bridge is the best treatment option for each case and following good oral hygiene practices and regular dental check-ups for long-term success is essential.

5. References

1. Village C. Dental Bridge Treatment Cheadle | Cosmetic Bridge | Cheadle Dental Practice. 2017.
2. Basem FA. Vertical tooth preparation in crown and bridge [University of Baghdad; 2022].
3. Alfarsi MA, Shaik S. Implant-supported fixed hybrid acrylic complete dentures opposing fully restored mandibular metal ceramic restorations. *BMJ Case Reports CP* 2020;13(2):e233913.
4. Cortellini P, Stalpers G, Mollo A, Tonetti MS. Periodontal regeneration versus extraction and dental implant or prosthetic replacement of teeth severely compromised by attachment loss to the apex: A randomized controlled clinical trial reporting 10-year outcomes, survival analysis and mean cumulative cost of recurrence. *Journal of Clinical Periodontology* 2020;47(6):768-76.
5. Guillaume B. Dental implants: A review. *Morphologie* 2016;100(331):189-98.
6. Goldstein RE, Patzer G. Concepts of dental esthetics. *Ronald E. Goldstein's Esthetics in Dentistry* 2018:1-22.
7. Duong HY, Rocuzzo A, Stähli A, et al. Oral health-related quality of life of patients rehabilitated with fixed and removable implant-supported dental prostheses. *Periodontology* 2000 2022;88(1):201-37.
8. Mouhyi J, Salama MA, Mangano FG, et al. A novel guided surgery system with a sleeveless open frame structure: a retrospective clinical study on 38 partially edentulous patients with 1 year of follow-up. *BMC Oral Health* 2019;19:1-17.
9. Khorsandi D, Fahimipour A, Abasian P, et al. 3D and 4D printing in dentistry and maxillofacial surgery: Printing techniques, materials, and applications. *Acta biomaterialia* 2021;122:26-49.
10. Ivvala J, Kuriachen B, Sharma VS. A Review on the selection of Dental Implant Material and Suitable Additive Manufacturing Technique in Dentistry. 2019.
11. Tahayeri A, Morgan M, Fugolin AP, et al. 3D printed versus conventionally cured provisional crown and bridge dental materials. *Dental Materials* 2018;34(2):192-200.
12. Waggoner WF, Nelson T. Restorative dentistry for the primary dentition. *Pediatric Dentistry: Elsevier*; 2019. p. 304-28. e3.
13. Das R, Bhattacharjee C. Titanium-based nanocomposite materials for dental implant systems. *Applications of Nanocomposite Materials in Dentistry: Elsevier*; 2019. p. 271-84.
14. Guo T, Gulati K, Arora H, et al. Race to invade: Understanding soft tissue integration at the transmucosal region of titanium dental implants. *Dental Materials* 2021;37(5):816-31.
15. Meloni SM, Spano G, Ceruso F, et al. Upper jaw implant restoration on six implants with flapless guided template surgery and immediate loadings: 5 years results of prospective case series. *Oral & Implantology* 2019;12(2):151-60.
16. Stewart MG, Bagby M. Clinical aspects of dental materials: Jones & Bartlett Learning; 2020.

17. Zhang D, Zheng L. Dental implants. *Emerging Trends in Oral Health Sciences and Dentistry* 2015;265-86.
18. Warreth A, Ibiyou N, O'Leary RB, Cremonese M, Abdulrahim M. Dental implants: An overview. *Dental Update* 2017;44(7):596-620.
19. Rao BS, Bhat SV. Dental implants: A boon to dentistry. *Archives of Medicine and Health Sciences* 2015;3(1):131.
20. Kaur G, Soni S, Singh M. Invisalign: Meeting Challenges with Newer Technologies. *International Journal of Health Sciences* 2021;5:46-52.
21. Eksteen NK. A comparison of equine dental abnormalities and their treatment found in various horse species. 2017.
22. Kirschen R, Littlewood SJ, Blazewska-Amin A, Fleming PS. Bonded orthodontic retention: a practical guide. *British Dental Journal* 2021;230(11):709-16.
23. Narwani S, Yadav NS, Hazari P, et al. Comparison of Tensile Bond Strength of Fixed-Fixed Versus Cantilever Single-and Double-Abutted Resin-Bonded Bridges Dental Prosthesis. *Materials* 2022;15(16):5744.
24. Gulati JS, Tabiat-Pour S, Watkins S, Banerjee A. Resin-bonded bridges—the problem or the solution? Part 1: assessment and design. *Dental update* 2016;43(6):506-21.
25. Zhang Y, Kelly JR. Dental ceramics for restoration and metal veneering. *Dental Clinics* 2017;61(4):797-819.
26. Abdullah AO, Muhammed FK, Zheng B, Liu Y. An Overview of Computer Aided Design/Computer Aided Manufacturing (CAD/CAM) in Restorative Dentistry. *Journal of Dental Materials & Techniques* 2018;7(1).
27. Jovanović M, Živić M, Milosavljević M. A potential application of materials based on a polymer and CAD/CAM composite resins in prosthetic dentistry. *Journal of Prosthodontic Research* 2021;65(2):137-47.
28. Scortecchi GM, Misch CE, Odin G. *Principles of basal implantology*: Springer; 2019.
29. Nouri A. Titanium foam scaffolds for dental applications. *Metallic Foam Bone*: Elsevier; 2017. p. 131-60.
30. Al-Asmar AA, Al-Hiyasat AS, Abu-Awwad M, et al. Reframing perceptions in restorative dentistry: evidence-based dentistry and clinical decision-making. *International Journal of Dentistry* 2021;2021.
31. Döringer S. 'The problem-centred expert interview'. Combining qualitative interviewing approaches for investigating implicit expert knowledge. *International Journal of Social Research Methodology* 2021;24(3):265-78.
32. Dikova T, Dzhendov D, Ivanov D, Bliznakova K. Dimensional accuracy and surface roughness of polymeric dental bridges produced by different 3D printing processes. *Archives of Materials Science and Engineering* 2018;94(2):65-75.
33. Kiyoshi-Teo H, Blegen M. Influence of institutional guidelines on oral hygiene practices in intensive care units. *American Journal of Critical Care* 2015;24(4):309-18.
34. Moussa DG, Aparicio C. Present and future of tissue engineering scaffolds for dentin-pulp complex regeneration. *Journal of tissue engineering and regenerative medicine* 2019;13(1):58-75.
35. Della Bona A, Pecho OE, Alessandretti R. Zirconia as a dental biomaterial. *Materials* 2015;8(8):4978-91.

Authors Contribution

Contribution	Ifwandi I
Concepts or ideas	√
Design	√
Definition of intellectual content	√
Literature search	√
Experimental studies	√
Data acquisition	√
Data analysis	√
Statistical analysis	√
Manuscript preparation	√
Manuscript editing	√
Manuscript review	√



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Citation Format: Ifwandi I. Dental bridge procedure to straighten loose teeth, a review. J Syiah Kuala Dent Soc. 2023; 8(1): 76-83.

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