



## DIASTEMA MEDIANA CLOSURE – MULTIDISCIPLINARY DENTAL PROSTHETIC SOLUTION-A CASE REPORT

Atanas Shukov<sup>1</sup>, Budima Pejkovska Shahpaska<sup>1,2\*</sup>, Bruno Nikolovski<sup>1,2</sup>, Maja Pejkovska Ilieva<sup>3</sup> and Genc Demjaha<sup>4</sup>

<sup>1</sup>PHI University Dental Clinical Centre St. Panteleimon-Skopje, N. Macedonia.

<sup>2</sup>Goce Delcev University, Faculty of Medical Sciences-Stip, N. Macedonia.

<sup>3</sup>PHI University Clinic for Gynecology and Obstetrics, Faculty of Medical Sciences, UKIM, N. Macedonia.

<sup>4</sup>UBT - University of Business and Technology, Kosovo, Pristina.



\*Corresponding Author: Budima Pejkovska Shahpaska

Goce Delcev University, Faculty of Medical Sciences-Stip, N. Macedonia.

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### ABSTRACT

**Introduction:** Dental closure of diastema mediana has been an interesting topic in the field of dentistry and its origin has been investigated. Therapists have had different opinions on the fact whether or not to close the space between the two central incisors and the opinions are divided. Some dentists are more prone to the natural approach, while on the other hand others have a tendency to insist on closing the diastema and an important factor is the patients' opinion. A 50-year-old male patient with previously worn semi-circular dental bridges for a period of 15 years came to the dental office, with immense pain. The semi-circular dental bridges needed replacement. Ortopantomographic pictures were made. The left semi-circular bridge has moved forward and there were periodontal changes with noticeable mobility on his anterior teeth. The patient underwent multidisciplinary treatment. For his periodontal changes the usage of dental lasers was helpful, after which there was stabilization of the mobility of his teeth. After a proper analysis a group of teeth were extracted. Temporary crowns were digitally designed. After that Zirconia circular dental bridge was manufactured with the CAD/CAM technique, with closure of the patients' diastema mediana. It is of great satisfaction if dental bridges last longer, but when they need replacement, there arouses a new situation needing different approach. In this case study after the multidisciplinary approach the patient was very satisfied with the new construction.

**KEYWORDS:** Diastema mediana closure, Semi-circular, Circular dental bridges.

### INTRODUCTION

Diastema mediana is a common condition in patients when they are children. Once the first permanent, and the second permanent molars erupt, the diastema can close by itself. However there are conditions in which this diastema still persists in adult patients, and there are multifactorial reasons for that. Some of the causes are frenulum labii superioris, periodontal diseases, persistence of mesiodens, discrepancy between the growth of the maxilla and mandible or parafunctional habits.<sup>[1,2,3,4]</sup>

Most of the conditions related to medial diastema mediana are genetically transmitted, and gynaecologists and paediatricians can hold a certain role in emphasizing the medico-genetic aspects of inheriting diastema mediana. A certain study showed that 49% of the patients from a group of 100 examinees had a hereditary factor.<sup>[5]</sup>

Treatment of diastema mediana is different. Sometimes it is not necessary once the growth and development are finished, the teeth finds its position and close the gap. Other approach is that sometimes the medial diastema is not treated, as it represents an authentic signature of the patient.

However if there are other reasons as stated above, first the etiological factor must be determined. Mostly dental therapists consults ortodontists as a first treatment modality.<sup>[6,7]</sup>

Then other modern options can be conservative treatment by using composite fillings.

Also the dental prosthetics enables faster and easier solution in the process of closing diastema mediana by a combination of veneers or crowns. Porcelain laminate veneers are a minimal invasive and a very popular solution, but should be used wisely when there is an indication.<sup>[8]</sup>

The aim of this study is to represent a complex case of multidisciplinary treatment of an adult patient who has diastema mediana in early childhood, in his adolescence and in his adulthood.

### MATERIAL AND METHODS

For the purpose of this study a 50 year old male patient that came to the dental office was analysed, inspected and treated using the multidisciplinary approach. The patient subjective symptomatology was pain deriving from his semi-circular dental bridges in his maxilla (figure 1). In the history of anamnestic data he stated that he had his diastema as a child, then as an adolescent and as an adult. He also said that his father and his son both have diastema mediana.



**Figure 1:** The patient with the semi-circular dental bridges.

He has worn the dental semi-circular dental bridges for a period of 15 years, which is satisfactory for us as therapists. Detailed analysis were made extraorally and intraorally. Extraorally the vertical dimension of the patient was decreased and after a period of 15 years, he started to experience both functional and aesthetic problems. Paraclinically a dental ortopantomographic photo was obtained from the patient (figure 2).



**Figure 2:** Dental ortopantomographic photograph.

After analysing the dental radiograph and both semi-circular dental bridges, it was foreseen that the left dental semi-circular bridge is protruded forward. Periodontal changes were evident with resorption of the bone and noticeable luxation of his upper left central incisor and

upper left lateral incisor, so they needed extraction. Also because of the traumatic occlusion from protrusion of the left dental semi-circular bridge he was in need of endodontic treatment of his upper left canine. After the endodontic treatment his upper left canine, the previously endodontically treated upper left first premolar and upper second premolar needed to be strengthened, and build up by posts and cores.

The periodontal changes were treated with different treatment modalities and with the help of dental laser, which highly improved the patients' condition.

While the period of healing after extraction took place, for the manufacturing of temporary crowns, intraoral scanner in the upper jaw was used and a temporary circular dental bridge was printed, and cemented temporary in the patients' mouth (figure 3).



**Figure 3:** The patient with the printed temporary dental circular bridge.

In the mandible, the patients' lower right second premolar needed extraction, after which a partial denture was manufactured.

After a period of three months and finishing of the healing process of the periodontal tissues, a definitive impression was taken with intraoral scanner and a Zirconia layered porcelain circular dental bridge was manufactured. After the proper fitting the Zirconia, porcelain layered dental circular bridge was cemented definitely in the patients' mouth (figure 4).



**Figure 4:** The definitive circular zirconia bridge.

## RESULTS AND DISCUSSION

The patient in this case report was known to the therapist for a long period of time. This can be a small longitudinal study, because the patient was treated 15 years ago with two semi-circular dental bridges, that at that time suited him perfectly and naturally imitating his medial diastema mediana. Some authors grade the interdental central incisor space. A study among Nigerian undergraduate students found that the width of a diastema tends to affect the aesthetic acceptability of the diastema, medial diastema mediana as most attractive was 1 mm while the least attractive diastema width was 4 mm.<sup>[9,10]</sup>

It is of great importance to potentiate the role of the young and early treatment of medial diastema mediana because the earlier it is predicted, with the help of gynaecologists, paediatricians, it can be treated more conservatory.<sup>[11]</sup>

Future parents that have medial diastema mediana, should expect that their offspring will predominantly inherit this condition. They must be educated when planning a family what to expect in the children's dentition. Besides many other aspects of prenatal, neonatal and postnatal examinations, parents must pay meticulous attention to the children's dentition.

When children are smaller removable orthodontic appliances can be of great help in closing the medial diastema mediana if the problem is orthodontic<sup>[12]</sup> When frenulum labii superioris influences<sup>[13]</sup> then oral surgery frenectomy is of great help, sometimes before the orthodontic treatment.

Then if the patient is adult and more conservative treatment modalities such as composite fillings or dental laminates are possible taken in consideration.<sup>[14]</sup>

However once the growth has finished as in our case study, a more detailed, complex, multidisciplinary approach is applied, that is far more invasive, complex and expensive. Sometimes maybe when the periodontal apparatus is affected the circular dental bridge is the only possible solution, like in the case report, because it suits both roles, the first one is to close the diastema mediana and the second one will serve as immobilization for the teeth with luxation changes. The patient had dental endodontic treatment and thus with combination of dental prosthetics preserved his teeth to serve him a long period. After the previously mentioned multidisciplinary approach the patient was prepared for the next digitally designed Zirconia, porcelain layer dental circular bridge. The patients' symptoms (the immense pain) that he came with initially completely disappeared with the new construction. The new circular dental bridge gave the patient a newly designed smile, previously from the one he had before, closing his diastema and enabling him a more nature and acceptable appearance. The closure of the diastema in this case was successful mostly because

of the extraction, that enables the dental prosthodontist and the dental technician to design that type of construction.

## CONCLUSION

The presence of diastema mediana is an interesting phenomena, whose roots should be researched in the history of dental anamnesis, regarding its hereditary factor. This will increase the terms of prevention by educating parents that plan family of the conservative methods of closure of the diastema. The adult patient with compromised periodontal tissue, luxation of a group of teeth, in this case study was treated multidisciplinary, and a closure of the medial diastema mediana was achieved. The diastema closure with circular dental bridge in this case report, is connected to the need to serve as an immobilization factor on the teeth with periodontal changes and teeth treated endodontically. However after finishing the entire multidisciplinary treatment protocol the satisfaction on the therapist, the dental technician and the patient were achieved, which is of great importance when functionally aesthetic rehabilitating a complex situation.

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