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Clinical Appearance of Anterior Teeth before Realization of Corono-Radicular Reconstitution by Inlay-Core

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Abstract **Original Research Article**

The coronal-radicular reconstruction is a restoration that involves both the coronal part and the root part of the tooth. The objective of this study was to evaluate the clinical aspects of anterior teeth before performing corono-radicular reconstruction by inclay-core. This was a descriptive cross-sectional study for analytical purposes with prospective data collection at the fixed prosthesis department of the CHU-CNOS over a period of six (6) months from (June 2019 to December 2019). The study population was made up of patients who underwent corono-radicular reconstruction (CPR) on anterior teeth by inlay core in the fixed prosthesis department of the CHU-CNOS. The patients were submitted to a questionnaire relating to general information, the reason for consultation, the oral examination, the type of coronal-radicular reconstruction. In this study, the female sex was the most represented with 61.40% of cases and a sex ratio of 0.62 in favor of women. Dental caries was the most represented pathology, 47.14% of cases. Retro-alveolar radiography was done in the vast majority of patients, ie 91.42% of cases. Aesthetics was the most represented reason for consultation with 95.70% of cases. More than three quarters (80%) of coronal-radicular reconstructions by inlay-core on anterior teeth were performed in the maxilla. All the walls were dilapidated in more than three-quarters of the cases, i.e. 77.15%. Corono-radicular reconstruction was performed to serve as a bridge pillar in 58.30% of cases. In our study, the mechanical principles of reconstitution were good in 91.40% retention and 94.30% stabilization. Lift was also good at 54.3%. The quality of these principles depends on the clinical stage (preparation) and the technical design in the laboratory. This prosthetic element must meet several objectives, hence the need for multidisciplinary care. Efforts must be made at all levels for prosthetic rehabilitation, especially in anterior relief.

Keywords: Clinical aspect, anterior teeth, Corono-Radicular Reconstruction, Inlay-Core, abutment.

INTRODUCTION

Corono-radicular reconstruction is a restoration involving both the coronal part and the root part of the tooth [1]. It is essential in fixed prostheses in clinical situations where the coronal retention of the abutment of the future prosthesis is reduced [2].

It aims to restore the functions of the decayed tooth, distribute the functional constraints within the remaining coronal and root substance, and restore aesthetics [2].

The inlay-core or false stump is the cast corono-radicular infrastructure indicated for the pre-prosthetic reconstruction of pulpless teeth with significant decay and loss of substance located just gingivally [3].

The restoration of anterior teeth is often a delicate task because of the importance of these teeth in communication and esthetics [4].

Crown and root reconstructions are essential in daily practice; more than 75% of depulped anterior teeth receive a cast crown and root reconstruction [5].

In Côte d'Ivoire, crown and root reconstructions are also common [6].

In Senegal, false stumps or inlay-core represent 74.5% of post prosthetic restorations [7]. In Mali we did not find any studies devoted to inlay-cores. In addition, we noted in the 2018 annual report of the fixed prosthesis department of the Center Hospitalier Universitaire National Odontostomatology Center (CHU-CNOS) that 60.60% of the joint restorations concerned the anterior teeth, including 37.5% of inlay-cores [8].

To contribute to the data concerning the restorations of anterior teeth on inlay-cores, we initiated this work which proposes as objective to study the clinical aspects of anterior teeth before realization of coronal-radicular reconstruction by inlay-core.

METHODOLOGY

The Fixed Prosthesis Service of the University Hospital Center - National Odontostomatology Center of Bamako served as our study framework.

This is a descriptive cross-sectional study for analytical purposes with prospective collection of data in the fixed prosthesis department of the CHU-CNOS. Our study took place over a period of six (6) months from (June 2019 to December 2019).

Our population was made up of patients who underwent corono-radicular reconstruction (CPR) on anterior teeth by inlay core in the fixed prosthesis department of the CHU-CNOS. We carried out an exhaustive recruitment of patients meeting the inclusion criteria.

The patients were submitted to a questionnaire relating to general information, the reason for consultation, the oral examination, the type of coronal-radicular reconstruction.

Were included all the patients having received CPR, volunteers and consenting, and having answered the questionnaires. Were excluded, all patients who did not agree to answer the questionnaires and those who received other prosthetic treatments. This was an exhaustive recruitment of patients consulted for prosthetic rehabilitation at the Fixed Prosthesis Service of the University Hospital Center - National Odontostomatology Center of Bamako during which we included 70 patients.

We're not included, those who did not want to leave the study and those who could not be followed until the end of their treatment.

Patients were informed of the aims of our study and the confidentiality of the information obtained. The survey was carried out through anonymous questionnaires. The individual clinical examinations were carried out after obtaining informed verbal consent from the patients. The data was entered on EXCEL 2010 and analyzed on EPI INFO version 3.5.4.

RESULTS

A total of 70 patients were examined, including 43 women and 27 men.

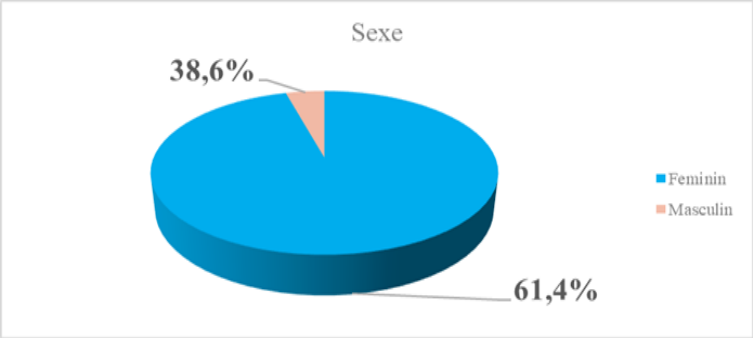

Fig-1: Distribution of patients by gender

The female sex was the most represented with 61.40% of cases and a sex ratio of 0.62 in favor of women.

Table-I: Breakdown of number by age group

Age group (years))	Number	Frequency
20-30	10	14,28
31-40	17	24,28
41-50	13	18,58
51-60	12	17,14
61 and over	**18**	**25,72**
Total	70	100

The most represented age group was that of 61 years and over, i.e. 25.72% of cases with an average age of 51 years and extremes ranging from 20 to 72 years.

Table-II: Distribution of patients according to causes

Dental history	Number	Frequency
Trauma	18	25,72
Decay	**33**	**47,14**
Other	19	27,14
Total	**70**	100

Dental caries was the most represented pathology with 47.14% of cases.
Others: non carious pathology, miolysis and iatrogenic.
Non-carious pathology: 7%, Miolysis: 4.2%, Iatrogenic: 2.1%,

Table-III: Distribution of patients according to the type of X-ray performed

Radiography	Number	Frequency
Retro-alveolar	**64**	**91,42**
Panoramic	6	8,58
Total	70	100

Retro-alveolar radiography was done in the vast majority of patients, ie 91.42% of cases.

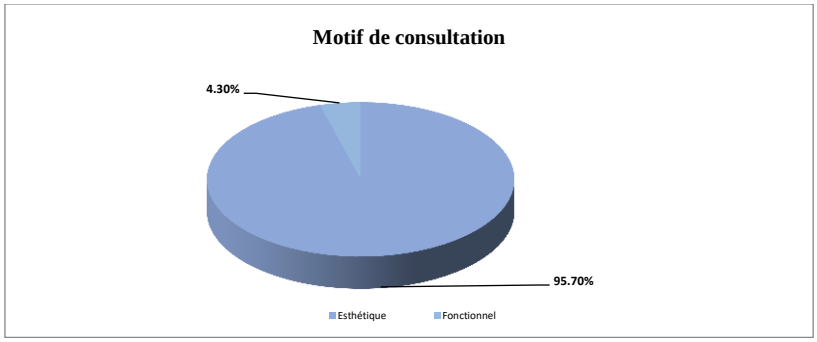

Fig-2: Distribution of patients by reason for consultation.

Aesthetics was the most represented reason for consultation with 95.70% of cases.

Table-IV: Distribution of patients according to oral hygiene

Oral hygiene	Number	Frequency
Good	16	22 ,86
Average	**50**	**71,42**
Nad	04	5,72
Total	70	100

Nearly three quarters of patients had average oral hygiene with 71.42% of cases.
Good: When the mouth is healthy, no periodontal disease.
Medium: Presence of some tartar.
Bad: Presence of a lot of tart.

Table-V: Distribution of patients according to site of corono-radicular reconstruction by inlay-core on anterior teeth

Replenishment site	Number	Frequency
Maxillary	**56**	**80**
Mandibulary	14	20
Total	70	100

More than three quarters (80%) of coronal and root reconstructions on anterior teeth by inlay-core were performed in the maxilla.
Height and prosthetic space were preserved in all cases.

Table -VI: Distribution of patients according to the walls of the decayed teeth

Decayed tooth walls	Number	Frequency
Vestibular	11	15,71
Lingual or palatal	2	2,86
Mesial	2	2,86
Distal	1	1,42
All walls	**54**	**77,15**
Total	70	100

All the walls were dilapidated in more than three-quarters of the cases, i.e. 77.15% of the cases.

Table-VII: Distribution of patients according to supragingival height Frequency

Supragingival height (mm)	Number	Frequency
1	**51**	**72,86**
2	16	22,86
3	02	02,86
4	01	01,42
5	00	00,0
Total	70	100

In nearly three-quarters of cases the supragingival height was 1 min.

Table-VIII: Distribution of patients according to the number of teeth to be reconstructed by inlay-core

Number of teeth to be reconstructed by inlay-core	Number	Frequency
1 tooth	**36**	**51,42**
2 teeth	11	15,72
3 teeth	9	12,86
4 teeth	9	12,86
5 teeth	4	5,72
6 teeth	1	1,42
Total	70	100

The inlay-core was performed by a unitary restoration of the cases, i.e. 51.42% of the cases.

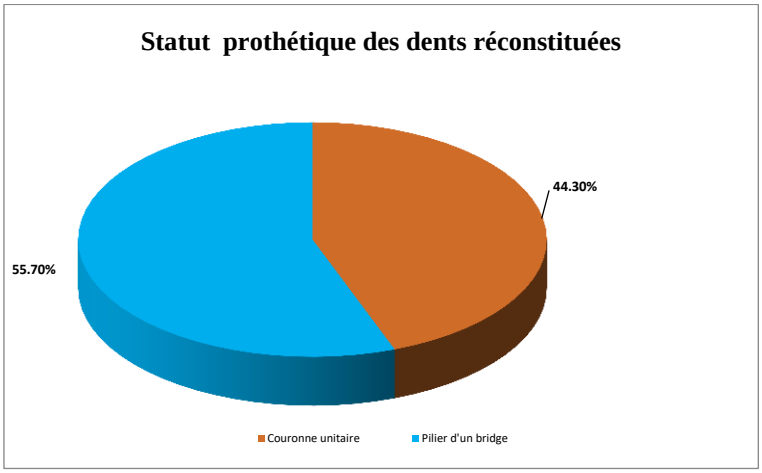

Fig-3: Distribution of patients according to the prosthetic type of reconstructed teeth

Corono-radicular reconstruction was performed to serve as a bridge pillar in 58.30% of cases.

Fig-5: Distribution of patients of patients according to the support of the prosthesis

The coronal-radicular reconstruction had good support in 54.30% of cases.

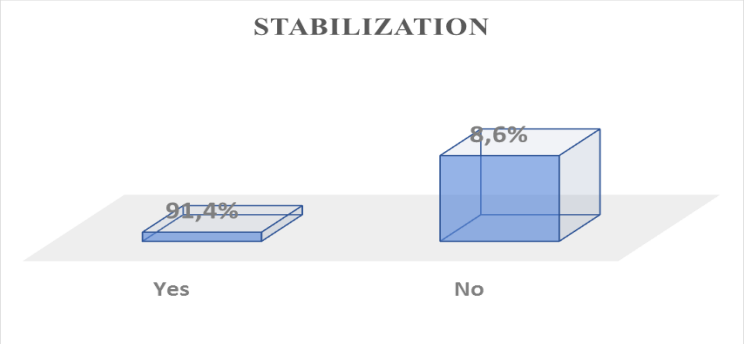

Fig-6: Distribution of patients according to the stabilization of the prosthesis

The majority coronal-radicular reconstruction was stable in 91.4% of cases.

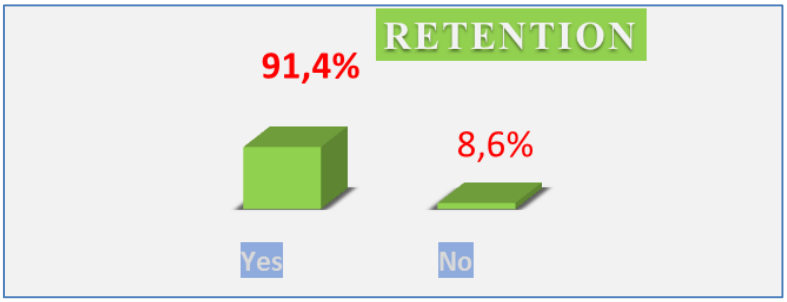

Fig-4: Distribution of patients according to prosthesis retention

The majority coronal-radicular reconstruction was retentive in 91.40% of cases

DISCUSSION

Our study focused on the clinical appearance of anterior teeth before coronal-radicular reconstruction by inlay-core in the fixed prosthesis department of the CHU-CNOS in Bamako.

● ***Gender***

In this study, the female sex was the most represented with 61.40% of cases and a sex ratio of 0.62 in favor of women. This result is in agreement with that of Mehdi [9] in Algiers in 2013 who reported a predominance of 78% of women. However differs from that of Didia [10] in Abidjan who found 65% male. This could be explained by the tendency of women to frequent health centers because they have more availability and place more value on aesthetic appearance.

● ***Age range***

The most represented age group was that of 61 years and over, i.e. 25.72% of cases with an average age of 51 years and extremes ranging from 20 to 72 years. This result is different from that of Traoré [11] in 2013 at the CHU-CNOS in Bamako who found a greater representation of the age group from 25 to 34 years old, i.e. 34.86% of cases with an average age 36.94 years and extremes ranging from 15 to 84 years. This

difference could be explained by the sample size, which was not large enough in our study, and also by the fact that young people are more and more interested in smiles and aesthetics.

● ***Cause***

Dental caries was the most represented pathology, nearly half of the decay and/or dental loss was due to caries, i.e. 47.14% of cases.

● ***Radiology***

Retro-alveolar radiography was done in the vast majority of patients, ie 91.42% of cases. However, the 8.58% who did the panoramic was not the ideal radiology.

● ***Reason for consultation***

Aesthetics was the most represented reason for consultation with 95.70% of cases. This result is different from that of Traoré [11] who reported 49.70 aesthetic cases as a reason for consultation. This could be explained by the choice of the type of anterior teeth in the present study and by the fact that these teeth contribute to the smile, obviously to aesthetics and self-esteem.

● ***Oral hygiene***

Nearly three quarters of patients had average oral hygiene, i.e. 71.42% of cases. However, we have 5.72% of patients with poor hygiene who benefited from oral hygiene education for an improvement in hygiene before reconstitution. This observation is comparable to the observations of Diallo [12] in 2019 in Mali and Thioune et al [13] who reported average oral hygiene in 67.14% and 68.04% of cases, respectively. These are proportional to the prevalence of dental caries which is most often responsible for decay and/or edentulousness [14].

- ***Headquarters of the reenactment***

More than three quarters (80%) of coronal-radicular reconstructions by inlay-core on anterior teeth were performed in the maxilla. This may be due to aesthetic damage to the anterior teeth of this arch.

● ***Dilapidated tooth walls***

All the walls were dilapidated in more than three-quarters of the cases, i.e. 77.15%. This could be explained by the delay in consulting patients with the dental surgeon. Decayed teeth, especially the anterior teeth, play a big role in the lack of aesthetics and self-esteem, hence their motivation for the choice of coronal-radicular reconstruction (inlay core).

● ***Supragingival height***

In nearly three-quarters of cases the supragingival height was 1 min. This contact is statistically comparable to the findings of Mehdi [9] who in his study found that the height of the residual hard tissue conditions the success of the reconstructions studied: We concluded that there was a significant difference between the success rate of the inlay-cores and the crown and root reconstructions with fiberglass posts with a significance level p = 0.014 in favor of inlay cores when the height of hard tissue is 2 to 3 mm. The observations of Viargues [15] have shown that around the tooth there is an attachment system composed of a conjunctive attachment and an epithelial attachment which measures on average a little more than 2 mm in height. The averages found by Gargiulo *et al*. [16] (conjunctiva attachment: 1.07mm, epithelial attachment: 0.97mm). So we can conclude that the supragingival height is an essential factor in the success and durability of coronal-radicular reconstructions.

● ***Number of teeth to be reconstructed by inlay-core***

The inlay-core was performed for a single restoration in 51.42% of cases. Our result is superior to that of Mehdi [9] during his study, who reconstructed 61.43% of single crowns with complete coverage.

● ***Prosthetic status***

Corono-radicular reconstruction was performed for bridge abutment service in 58.30% of cases. This result is comparable to that of Mehdi [9] who reported in his study that 47.8% of coronal-radicular reconstructions were single and on anterior teeth, and 46.70% served as bridge pillars.

● ***Retention, stabilization and sustenance***

In our study, the mechanical principles of reconstitution were good in 91.40% retention and 94.30% stabilization. Lift was also good at 54.3%. They guarantee the durability of coronal-radicular reconstructions. The quality of these principles depends on the clinical stage (preparation) and the technical design in the laboratory.

CONCLUSION

Corono-radicular reconstruction, also called inlay-core or false stump, involves both the coronal and root portions of the tooth.

Reenactments are for all ages. Dental caries is the most found etiology, the greater the decay, the less the mechanical principles (support, stabilization and retention) are difficult to respect. The often spectacular aesthetic response.

This prosthetic element must meet several objectives, hence the need for multidisciplinary care. Efforts must be made at all levels for prosthetic rehabilitation, especially in anterior relief.

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