# FIXED SADDLE BRIDGES

*by*

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## INTRODUCTION

There has been very little written about the application of fixed saddle bridges on a reduced amount of abutments, a substitute for partial plates with complicated devices for the attachment of the saddles to the abutments.

*Dahl* has introduced the term »superplant» for extreme fixed saddle construction, and has studied the mechanical principles of superplants (*Dahl*, 1963, 1967) and also their clinical application in a series of four cases (*Dahl*, 1965).

*Izikowitz* (1966) has described different types of fixed saddle bridges; a) unilateral with a free end saddle on one side, b) bilateral with a free end saddle on both sides and c) intermediary saddle with saddle between abutments. They were observed for 5 and 6 years. No tissue reactions were observed, not even in the two bilateral free end saddles of the lower jaw. However, the opposing jaw was in these cases edentulous and fitted with a plate.

It is the purpose of this paper to illustrate the value of fixed saddle bridges on a reduced number of abutments in the light of the author's personal experience.

Table I
*Case materials*

| Case no. | Name | Born | Abutments | Saddles | Type | Inserted |
|---|---|---|---|---|---|---|
| 1. | mr A.B. | 1890 | 1+3+, +3+2+1 | 2+4+5+, +5+4 | upper bilateral | sept. 1939 (Fig. 1A) |
| 2. | mrs A.S. | 1910 | 1+, +3+2+1 | 2+3+4+5+, +5+4 | upper bilateral | april 1944 |
| 3. | mrs P.L. | 1882 | 1+2+3+, +2+1 | 4+5+6+, +6+5+4+3 | upper bilateral | dec. 1956 |
| 4. | mrs A.L.F. | 1904 | 1+3+5+, +2+1 | 4+6+, +6+5+4+3 | upper bilateral | nov. 1960 |
| 5. | mrs A.Kj. | 1891 | 1+2+3+, +2+1 | 4+5+6+, +6+5+4+3 | upper bilateral | nov. 1960 |
| 6. | ms S.L. | 1892 | 1+2+3+, +3+1 | 4+5+6+, +6+5+4+2 | upper bilateral | nov. 1962 |
| 7. | mr H.H. | 1897 | 3—4—, —4—3 | 1—2—5—6—, —6—5—2—1 | lower bilateral | dec. 1957 |
| 8. | mrs G.J. | 1889 | 3—, —3 | 1—2—4—5—6—, —6—5—4—2—1 | lower bilateral | febr. 1958 |
| 9. | mrs I.H. | 1899 | 1—2—3—, —3—2—1 | 4—5—6—, —6—5—4 | lower bilateral | june 1959 |
| 10. | ms S.A. | 1912 | 2—3—, —3—2—1 | 1—4—5—6—, —6—5—4 | lower bilateral | may 1960 (Fig. 2A) |
| 11. | mrs G.H. | 1918 | 2—3—, —5—4—3—2 | 1—4—5—6—, —6—1 | lower bilateral | dec. 1960 |
| 12. | ms S.L. | 1892 | 2—3—4—, —4—3—2 | 1—5—6—, —6—5—1 | lower bilateral | nov. 1962 |
| 13. | mr C.L. | 1886 | 1+2+, +7+3+2+1 | 3+4+5+6+, +6+5+4 | upper unilateral | june 1944 (Fig. 3A) |
| 14. | mr H.H. | 1897 | +7+5+3 | 1+2+3+4+5+6+, +6+4+2+1 | upper unilateral | dec. 1957 |
| 15. | mr E.S. | 1894 | 7—, —3—2—1 1— | 2—3—4—5—6—, —7—6—5—4 | lower unilateral | june 1960 |
| 16. | mr B.B. | 1905 | 3+, +7+5+4+3 | 1+2+4+5+6+, +6, +2+1 | upper unilateral | sept. 1960 |

Comments

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1961 decay in +1. Periapical changes in 1+, +3.
Construction removed and substituted by a plate (Fig. 1 B)

1964 decay in +3. Periapical changes in 1+, +2.
Construction removed and substituted by a plate.

1967 decay in 1+, +1. Paradentitis in +2, pockets at 3+.
Construction removed and substituted by a plate.

Examined march 1967: Feeling of tension, pockets at 5+, slight widerning of periodontal membrane at +2, otherwise no symptoms.

Examined nov. 1965. Periapical changes in +2, +1, apicectomy. Otherwise no remarks.

Examined april 1967. Endodontic treatment +1. Otherwise no remarks.

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Died 1960. Bridge then without remarks.

An extreme case, not recommended. Would rather make a fixed bridge —3 —3— and a removable bilateral free end saddle coupled to the bridge. Examined 1960, widening of periodontal membrane in 3—, —3.

This case was a failure, owing to bruxism, which caused the construction to break. 1961: Paradentitis around the abutments.

Examined sept. 1967. Paradental conditions denser. (Fig. 2 B).

Examined april 1967. Widening of periodontal membrane at 2—. Otherwise no remarks.

1965 periapical paradentitis 2—, apicectomy.
Examined april 1967, no remarks.

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Examined march 1956. (Fig. 3 B). Resorption at the alveolar bone margin, decay in 1+. Otherwise no remarks. Died 1957.

Periodontal pocket mesially in +7, periapical changes in +3.
Otherwise no remarks. Died 1960.

Examined dec. 1966. Root canalfilling and pivot in —3, rarefaction of paradental bone, —2 root canal filled, 1—, —1 widening of periodontal membrane. Died april 1967.

1964: 3+ loosened and fixed with a screw.
Examined 1967. No remarks.

## MATERIAL AND METHOD

During the past three decades the author used fixed saddle bridges in treating altogether 55 patients, and the saddle bridges included upper bridges with abutments only in the front region and with saddles backwards (14 cases), lower bridges similarly constructed (18 cases) and unilateral bridges, with abutments in the front and on the one side (23 cases). In order to evaluate the results the details of sixteen cases were collected (Table I). Cases 1—6 represent the upper bridges, cases 7—12 the lower bridges, and 13—16 the unilateral bridges. These cases were observed for 2 to 22 years.

The technique was as follows: After the preparations were made, impressions with tincaps were taken with plaster. The bite was recorded in the usual way. The teeth were set up, impressions were taken of the teeth, saddles moulded and the teeth fastened with acrylic. The abutments were then constructed in the usual way; full crowns with facings of acrylic. The bridge was thus made on the model obtained from the plaster impression. Consequently these was no pressure on the alveolar crest.

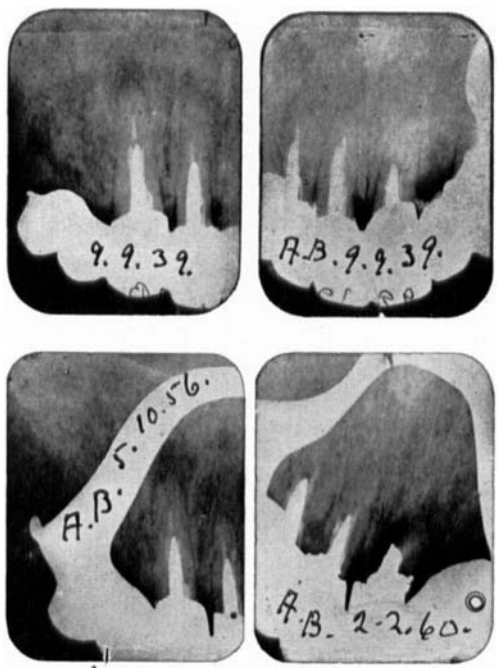


Fig. 1. A. Case nr. 1 in 1939. In this and in the following figures the teeth are viewed from the inside.

Fig. 1 B. Case nr. 1 exhibiting periapical changes in +3 in 1956 (left), and root resorption in 1+ in 1960 (right).

## RESULTS

Information regarding the number of abutments, the type of construction, and the observation period is summarized in Table I. Further details are given in the radiographs (Figs. 1—3).

## DISCUSSION

The balance between the load on the abutments and on the alveolar crest is difficult to achieve. This is apparently easier in the upper jaw on account of the submucosal layer, which seems to withstand the load better than the lower jaw with no submucosa. A palatal bar was first used, but as it caused trouble in one case, it was disgarded. Later the construction was made rather heavy between the abutment and the saddle. In the lower jaw no lingual bar is possible, hence a reinforced construction was used there.

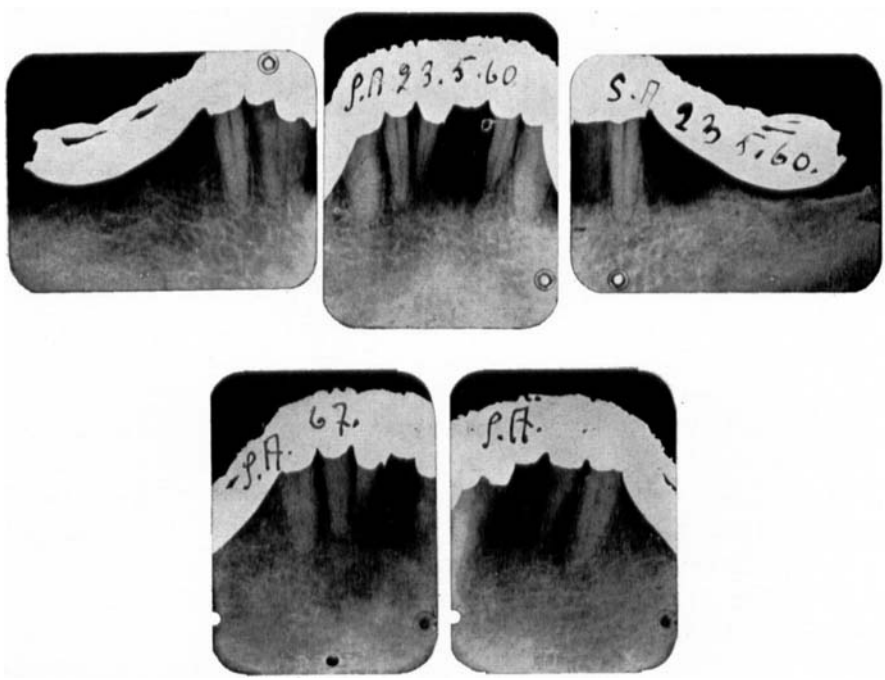


Fig. 2 A. Case nr. 10 in 1960.
Fig. 2 B. Case nr. 10 in 1967. The alveolar bone structure appears denser than in 1960.

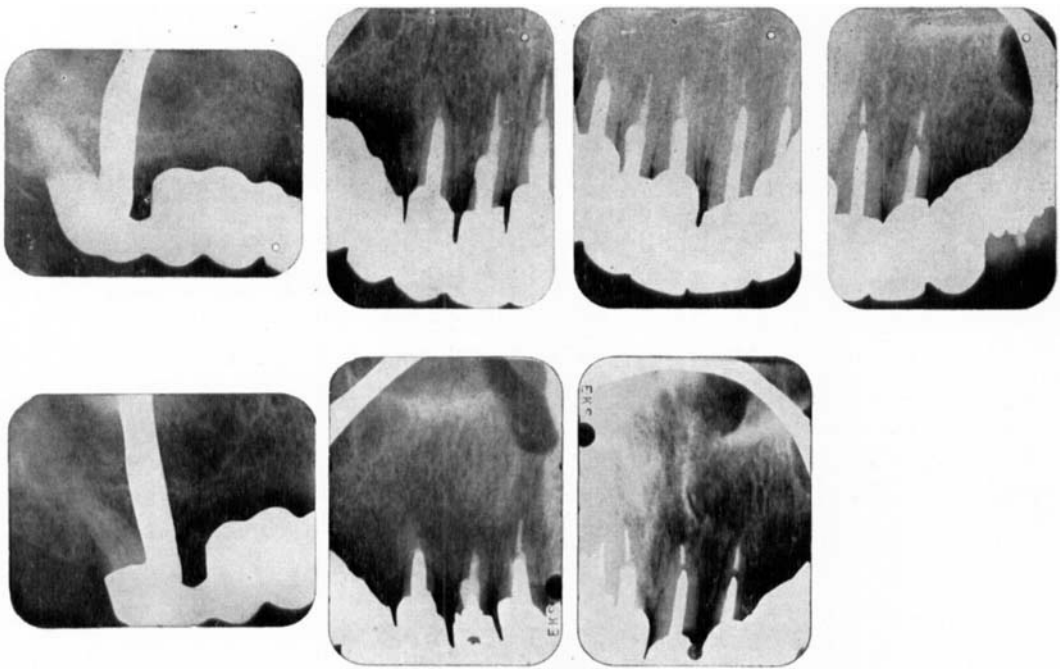

Fig. 3 A. Case nr. 13 in 1944.
Fig. 3 B. Case nr. 13 in 1956. Resorption of the alveolar bone margin, decay in 1+.

Regarding the fate of the construction, in all 55 of the author's cases, it was better in the unilateral cases. For the bilateral free end saddles, the prognosis was better in the upper jaw than in the lower, better in younger than in older patients, and also better in instances where there are abutments in the front. The capacity of the abutments holding a bilateral free end saddle bridge was, however, remarkable.

As to the lower bilateral free end bridge, there has been much discussion regarding the risk for decubitus, and its avoidance. As has been said, the bridge can be set temporarily. Another way is to make the saddles removable by the dentist. However, this is a clumsy method, as the attachment must then be made very strong and thick.

Regarding the contraindications bruxism may be mentioned, since it may deteriorate the construction.

The abutments should be fully covered, especially in the free end cases, where heavy load is expected. It is also recommended to set them temporarily for a long period before permanent cementation.

SUMMARY

The author described fixes saddle bridges with a rather limited number of abutments. Three categories of cases are presented: upper bridges with abutments only in the front region and with saddles backwards (14 cases), lower bridges similarly constructed (18 cases) and unilateral bridges, with abutments in the front and on the one side (23 cases). The cases have been observed for 2 to 22 years.

The capacity of the abutments to carry a bilateral free end saddle bridge was remarkable.

Among the contraindications may be mentioned bruxism, which will deteriorate the construction.

RÉSUMÉ

PONTS FIXES A SELLES

L'auteur décrit des ponts à selles ayant un nombre assez réduit de piliers. Trois catégories de cas ont été observés: ponts à la machoire supérieure avec piliers seulement dans la région antérieure et selles dans la région postérieure (14 cas); ponts de construction analogue à la machoire inférieure (18 cas); et ponts unilatéraux avec piliers dans la région antérieure et d'un côté en arrière (23 cas). Ces cas ont été suivis pendant 2—22 ans.

L'aptitude des piliers à supporter un pont bilatéral à selles en extension était remarquable.

Parmi les contre-indications, on peut mentionner le bruxisme, qui amènera une détérioration de la construction.

ZUSAMMENFASSUNG

FESTE SATTEL BRÜCKEN

Der Verfasser beschreibt feste Sattel Brücken mit einen beschränkten Anzahl von Pfeiler. Drei Kategorien von Fällen sind vorgestellt: obere Brücken mit Pfeiler nur in Frontzahnbereich und mitt Satteln rückwärts (14 Fälle). Untere Brücken ähnlich konstruirt (18 Fälle) und unilaterale Brücken mit Pfeiler im Frontzahnbereich und an der einen Seite (23 Fälle). Die Fälle wurden von 2 zu 22 Jahre observiert.

Die Eigenschaften der Pfeiler eine bilaterale freiend Sattel Brücke zu tragen war erstaunend.

Unter den Kontraindikationen wird erstens den Bruxismus erwähnt, der die Konstruktion bald zerstört.

REFERENCES

*Dahl G.*, 1963: Mechanical principles of superplants. Acta odont. scand., *21:* 515.
—»— 1965: Superplantate. Biomechanik und klinische Anwendungsmöglichkeiten. Quintessenz, Zahnärztl. Lit. *16:* 45.
—»— 1967: Superplantatens teori och klinik. Svensk Tandl. Tidskr. *60:* 749.
*Izikowitz L.*, 1966: The Superplant. Acta Odont. sdand. *24:* suppl. 47.

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