

# **SELF-LIGATING BRACKETS REVISITING**

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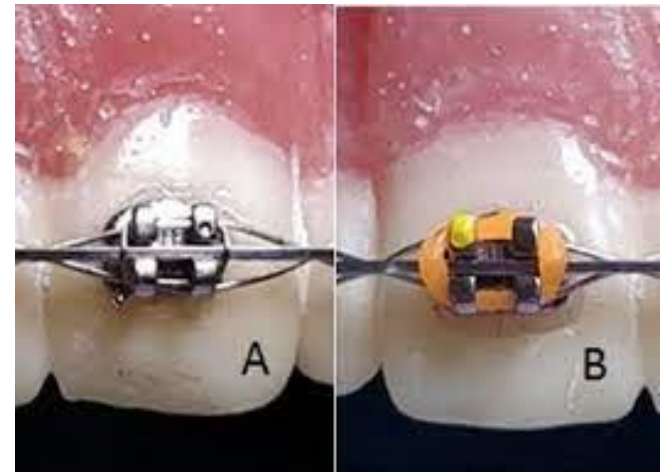
# History

## ✓ Stainless steel Ligature

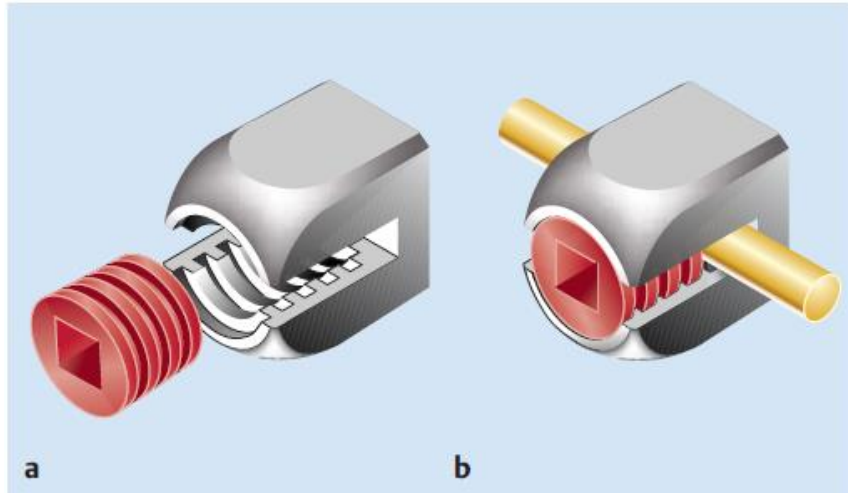
Cheap, robust, free from deformation and degradation  
11 minutes to remove, trauma!

## ✓ Elastomeric ligatures (1960s)

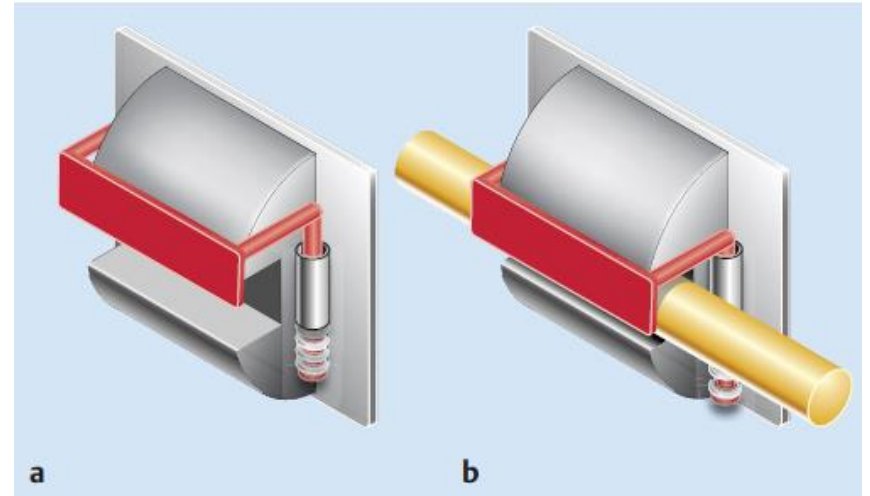
Easy, speed of placement  
High force, friction, deformation.



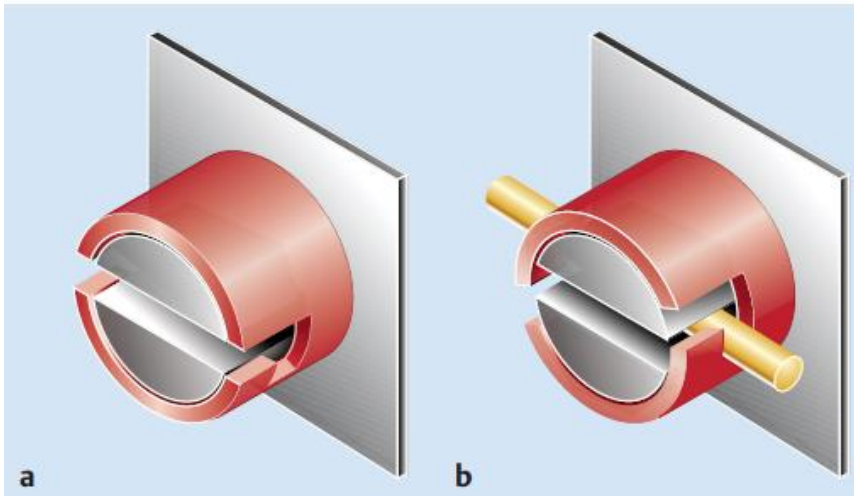
# Self-Ligation 1930s



Russell attachment (1935)



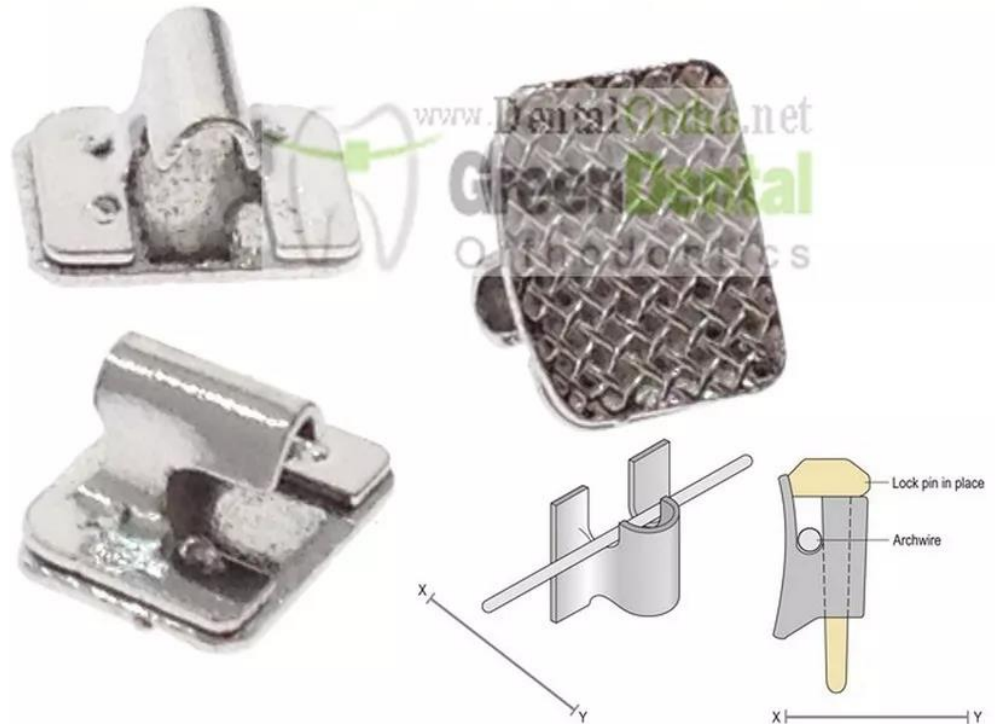
Boyd bracket (1933)

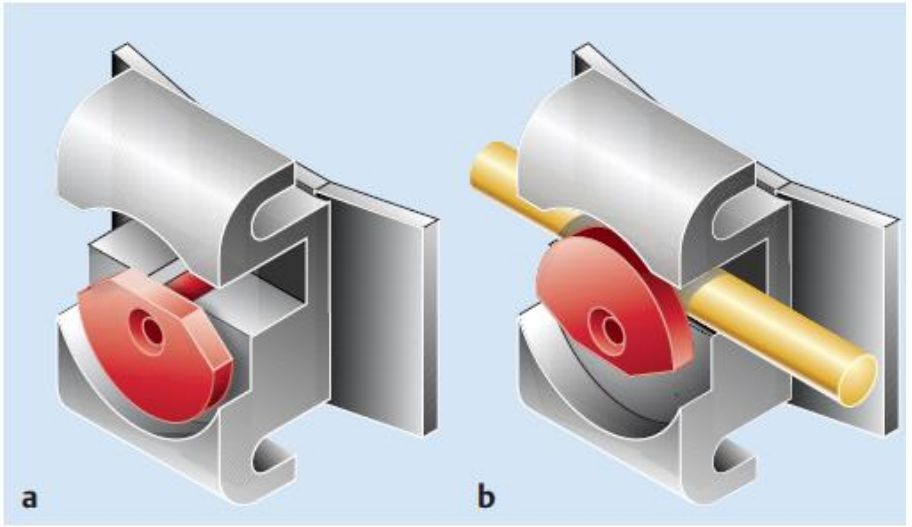
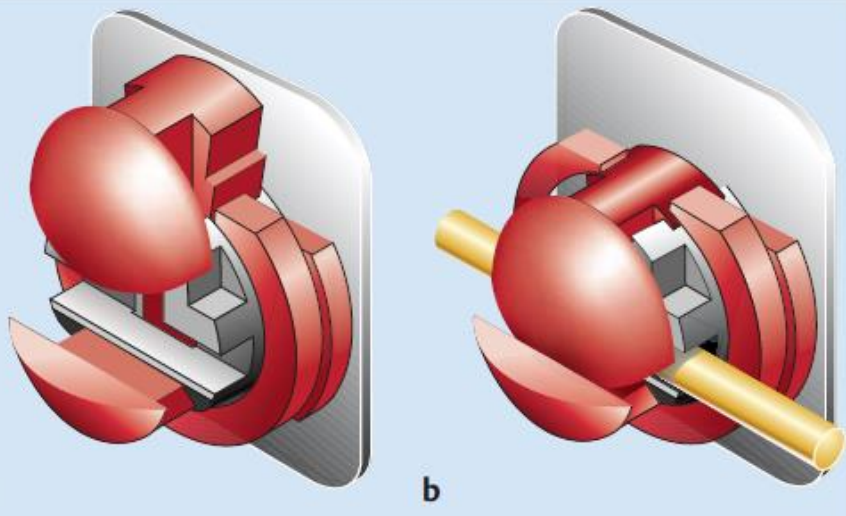


Ford bracket (1933)

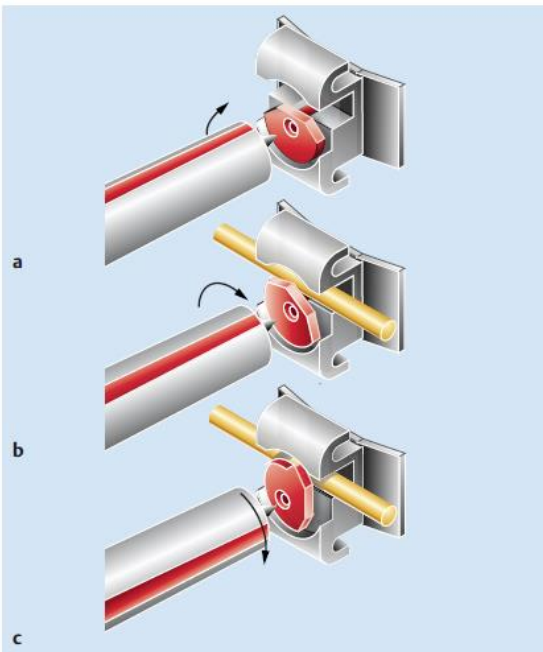
# ✓ Begg Pin 1950

CE 0197 FDA ISO13485 ISO9001





EdgeLok bracket 1970 (Commercially available, out of production)



Mobil-Lock bracket 1973

**1980s The Speed bracket was the first active self-ligating bracket (Hanson).**





# Requirements of SLB

- ✓ It is very easy to open and close with low forces applied.



- ✓ It never opens inadvertently.



# Requirements of SLB

- ✓ It has a ligating mechanism that never jams or breaks or distorts or changes in its performance through the treatment period.
- ✓ It is not significantly affected by buildup of calculus.





# PROPOSED ADVANTAGES OF SELF-LIGATING BRACKETS

## ▪ **Speed of Archwire Insertion and Removal**

- ✓ 4 Folds faster when compared to conventional brackets.
- ✓  $\approx$ 1 minute per set of archwires may reach to 24 seconds

> [Clin Exp Dent Res](#). 2022 Dec;8(6):1456-1466. doi: 10.1002/cre2.642. Epub 2022 Aug 26.

**Operating time for wire ligation with self-ligating and conventional brackets: A standardized in vitro study**

Paolo M Cattaneo <sup>1</sup>, Michele Tepedino <sup>2</sup>, Emilie B Hansen <sup>3</sup>, Anna R Gram <sup>3</sup>, Marie A Cornelis <sup>1</sup>

# PROPOSED ADVANTAGES OF SELF-LIGATING BRACKETS

- **Secure Archwire Engagement**



# PROPOSED ADVANTAGES OF SELF-LIGATING BRACKETS

## ▪ Friction and Self-Ligation

Debatable!

Thin and flexible wire

Many studies reported lower friction with SLB

Friction per bracket 15g with SLB and 41g with conventional brackets

Thick and stiff wire

No significant difference



# SELF-LIGATION AND PATIENT COMFORT

**SLB reduce pain, debatable!**

**One study examined GCF found less inflammatory markers in SLB**

> [World J Orthod.](#) 2009 Summer;10(2):141-6.

**The Damon System and release of substance P in gingival crevicular fluid during orthodontic tooth movement in adults**

[Masaru Yamaguchi](#)<sup>1</sup>, [Tsutomu Takizawa](#), [Ryo Nakajima](#), [Ryuichi Imamura](#), [Kazutaka Kasai](#)

# Passive vs. Active Self-ligation

Passive

Active



Slot Depth approx. 0.028"



Slot Depth between 0.0175" - 0.020"



Wire less than 0.018 (no difference except if it is lingually deflected)

Thick wire

## Practical tips

- Because archwire changes are faster and easier, take advantage of this to more routinely remove, check, and replace archwires.
- In view of the much lower friction be rigorous in placing stops or hooks on the archwire to prevent distal wire pokes.
- After teeth are aligned, there is then no advantage in scheduling appointments less frequently than with conventional ligation. This only prolongs treatment.
- When planning extractions, the easier alignment of irregular teeth with self-ligation without extraction spaces should be one of the factors in the decision.



Thank

You