



Multiband Techniques II

Semmelweis Egyetem
Gyermekfogászati és Fogszabályozási Klinika
Dr. Nemes Bálint



Multiband techniques

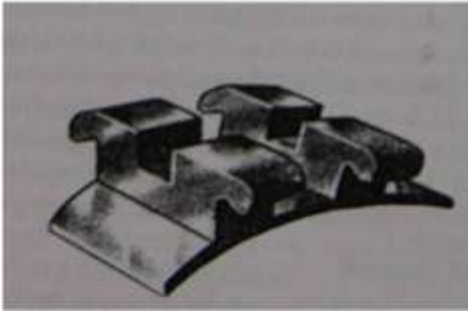
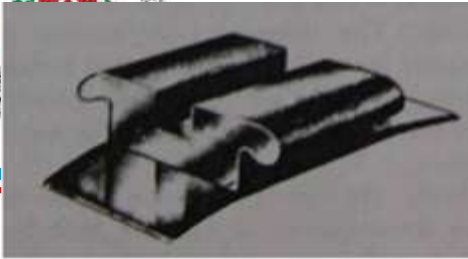
1. Tweed-Merrifield standard edgewise technique
2. Begg light wire System – 1956
3. Straight wire technique
4. Roth straight wire technique
5. MBT technique
6. Alexander technique
7. Bidimensional technique
8. Selfligating technique
9. Lingual technique



Tweed-Merrifield standard edgewise technique

0,022X0,028 Slot 90° to the bracket base, all brackets are the same

0,017X0.022- 0,0215X0, 028 wires



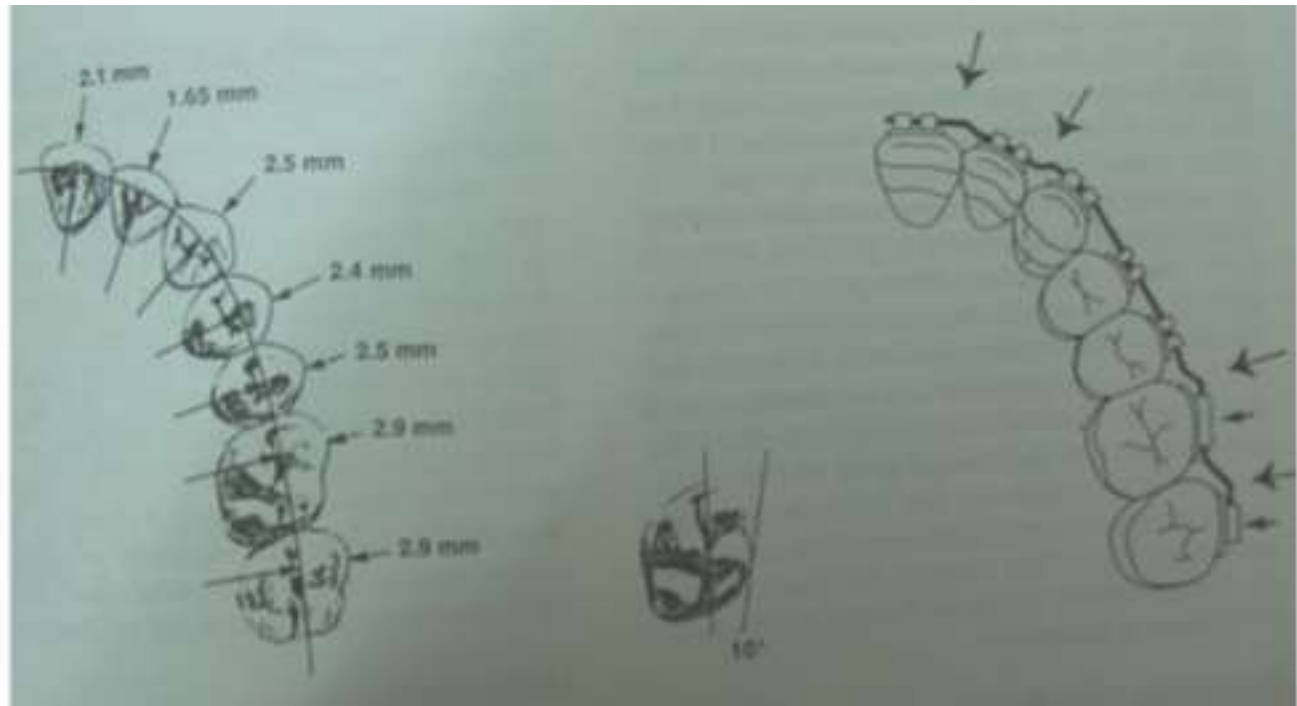
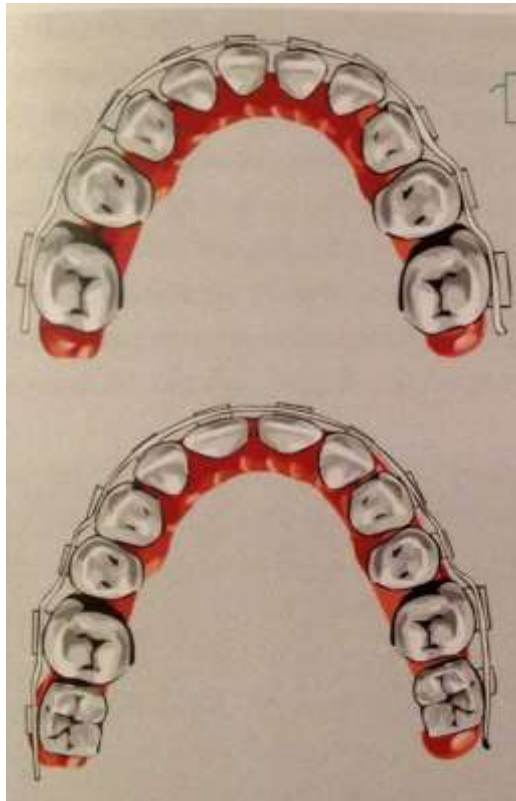
Breid Front-Brackets Twin-Brackets on the molars





The position of the teeth is defined by the bendings

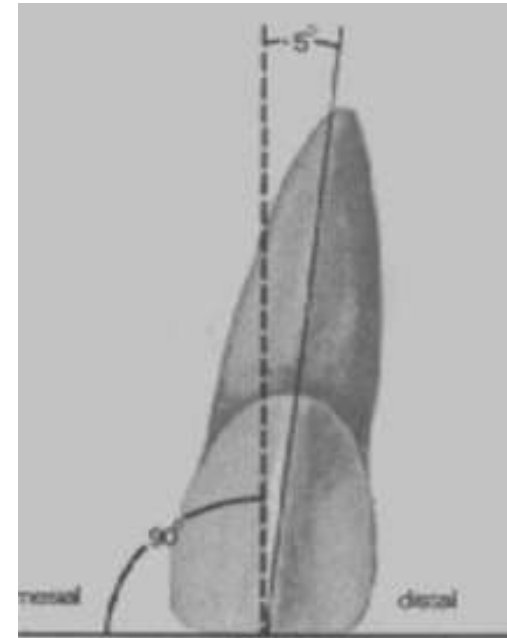
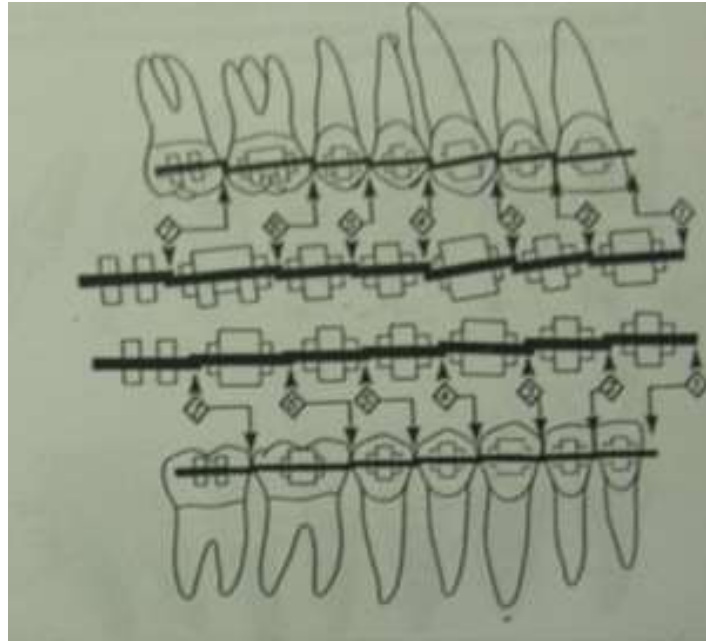
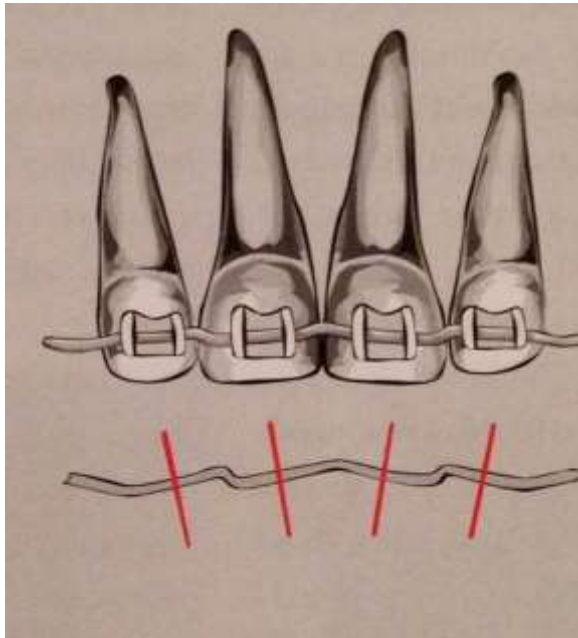
First class bendings: vestibulo-oral / in-out





The position of the teeth is defined by the bendings

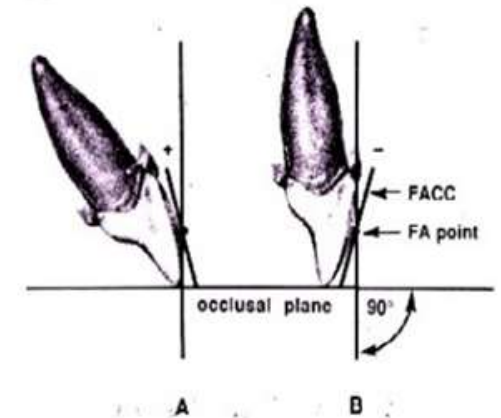
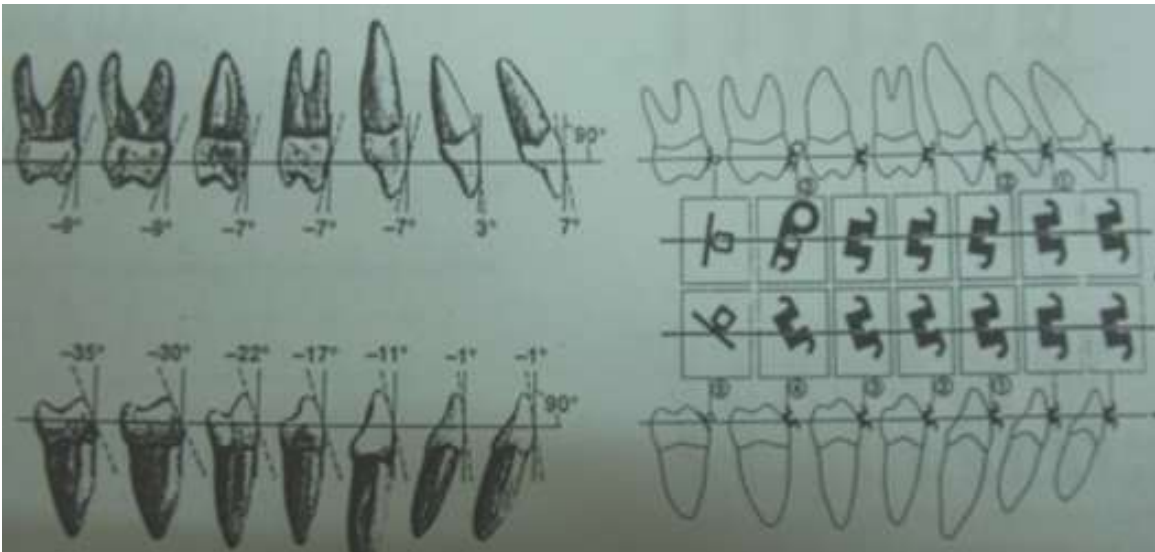
Second class bendings: mesio-distal - Angulation





The position of the teeth is defined by the bendings

Third class bendings: Torque



together 76 bendings!!

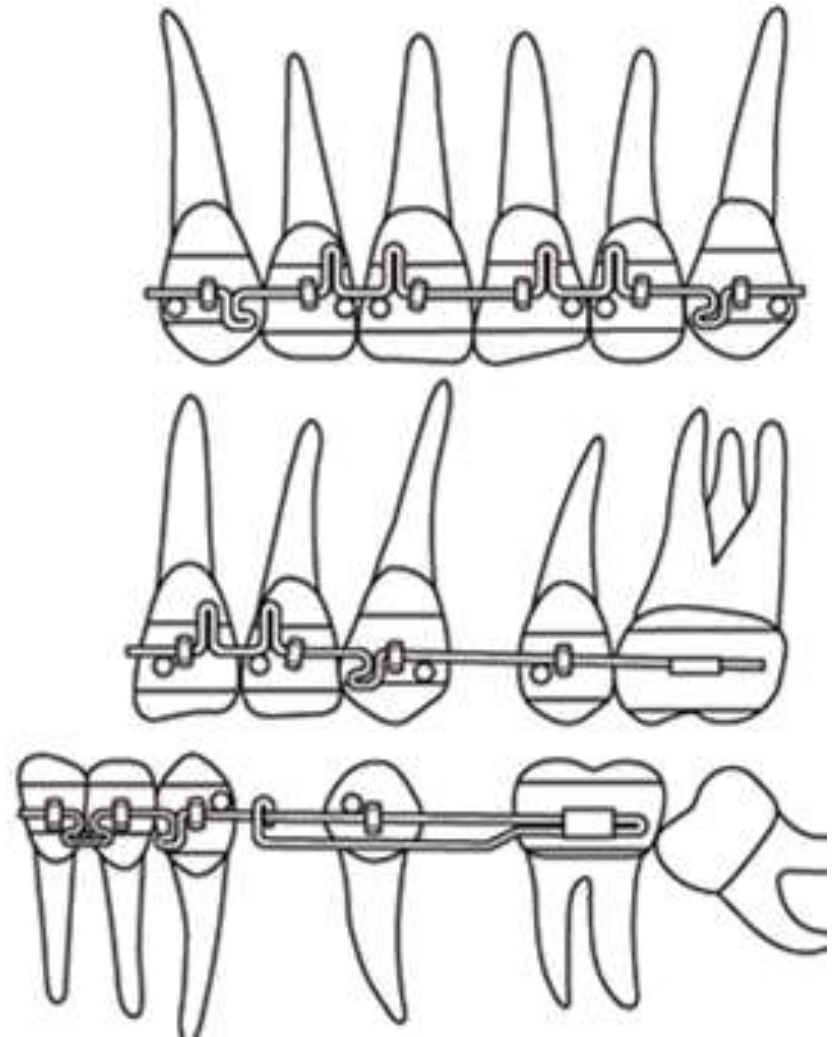


Begg light wire System - 1956

**Ribbon arch Brackets of
stainless steel**

0,016 ruond multiloop

Low forces frictionfree
mowements

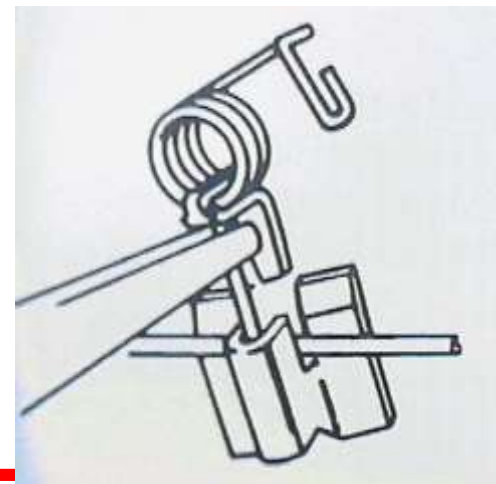
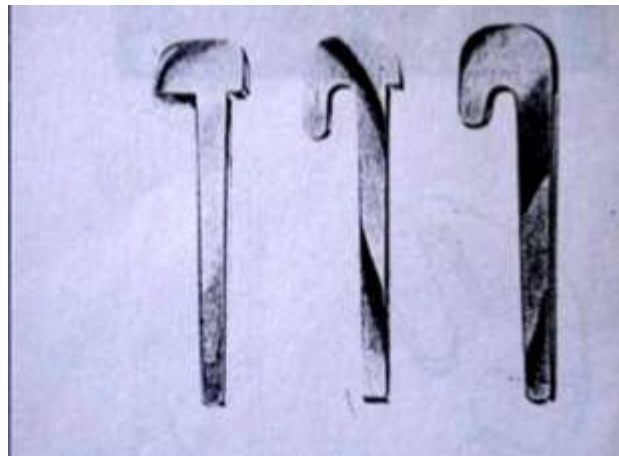




Vertikal Slot lingival
opened(0,20x0,45)

The wire is fixed with pins

Angulationsprings





From the 50-s information is started to
programed in the bracket slot

1959 - Torque bracket - Ivan F. Lee

1960 - AAO Meeting

**Joseph R. Jarabak und James
Fizzell** *Torque und Angulation*

1970 - Lawrence Andrews 6 keys of
occlusion

1972 - Straight Wire Appliance
In-out, Angulation, Torque



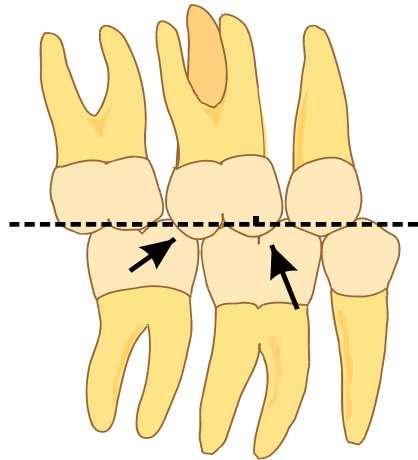


Straight Wire Appliance

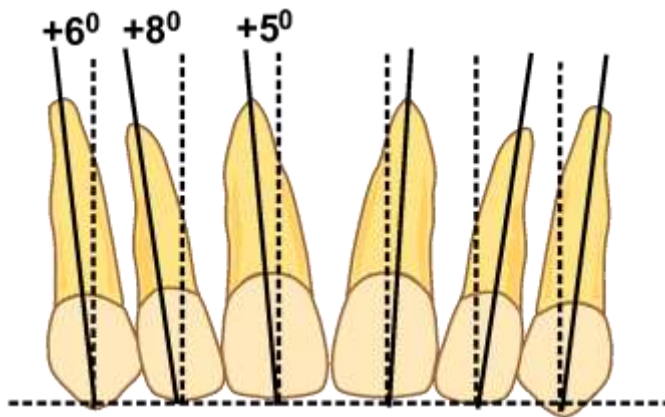
1970 – Andrews: The 6 keys of occlusion

120 Patients with perfect occlusion without
Ortho tx

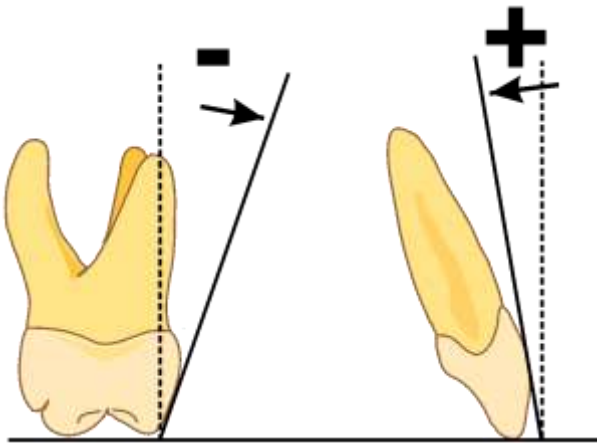
Fixes the criteria of the correct static occlusion



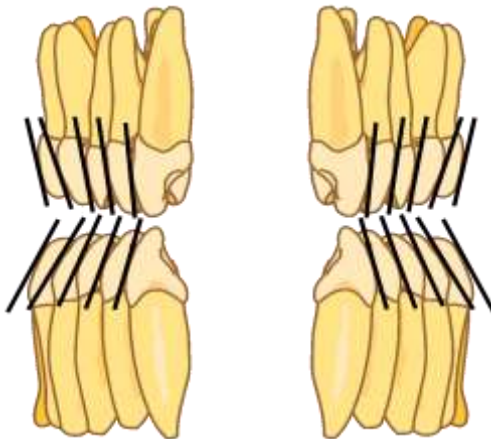
1. The position of the arches to each other

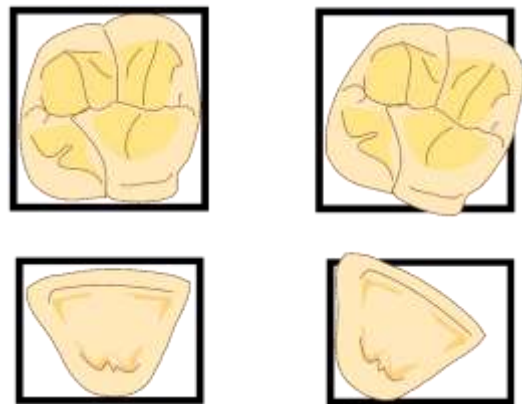


2. Angulation of the crowns



3. Vestibulo-oral inclination of the roots (Torque)

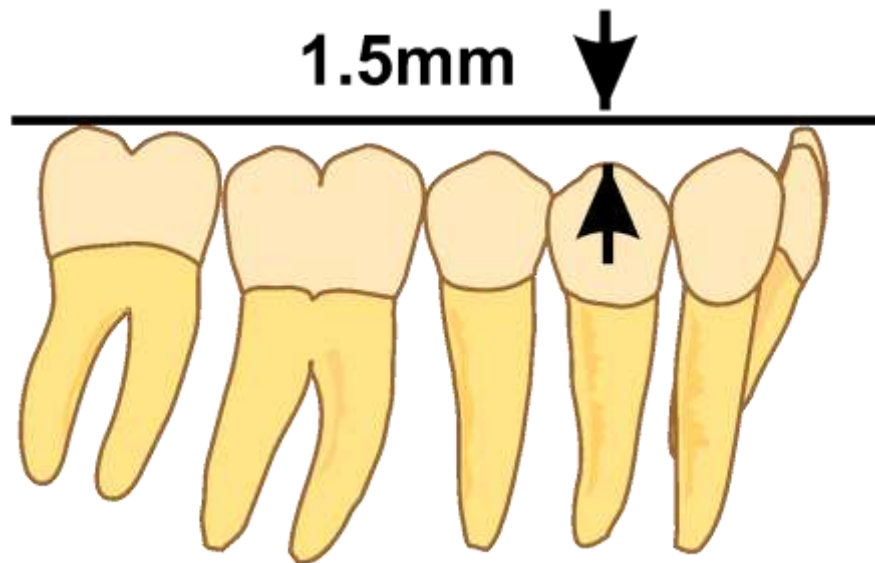




4. No rotations



5. No spaces



6. Flat Spee-curve



„full programmed”

„preadjusted”

(In-out, Angulation, Torque)

In-out: Thickness of the Bracket-Base

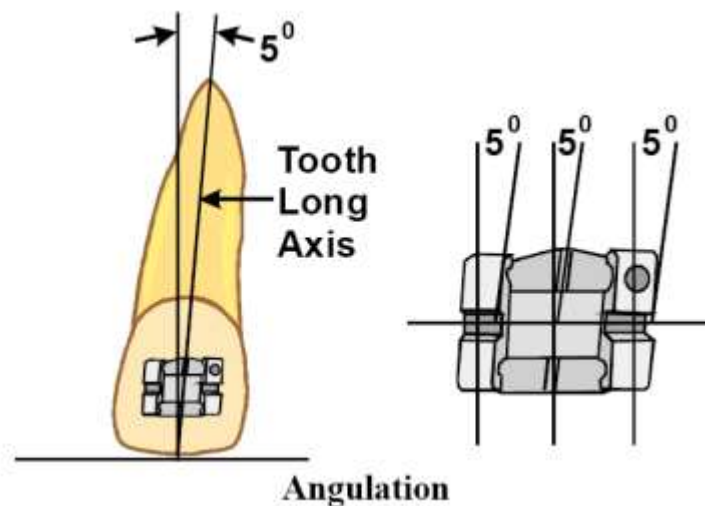
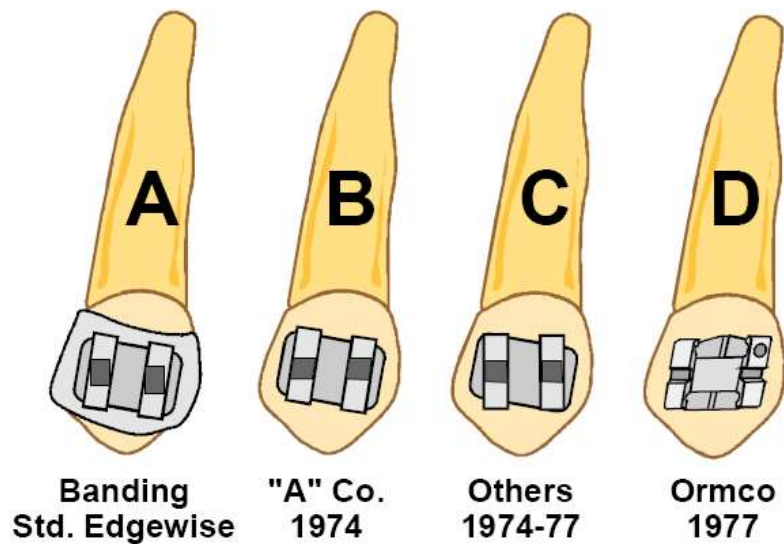
Angulation: The slot is angulated to the bracket axis

Torque: Torque of the slot to the bracket base



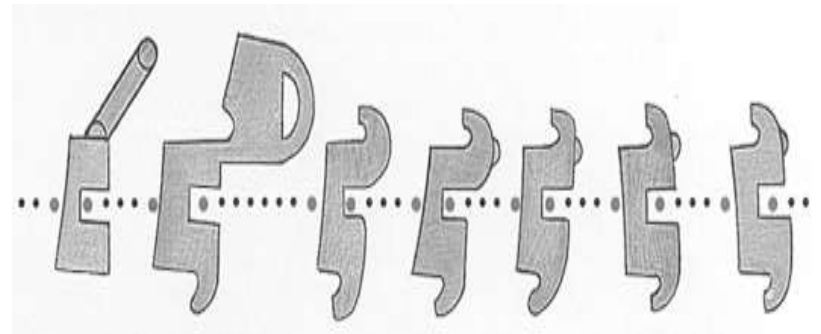
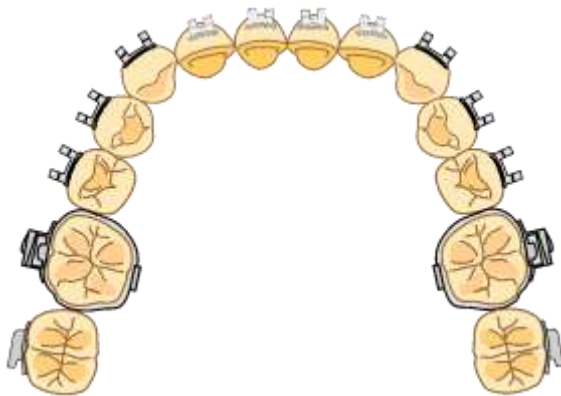


Romboid form





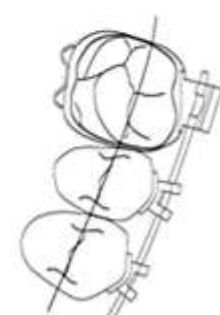
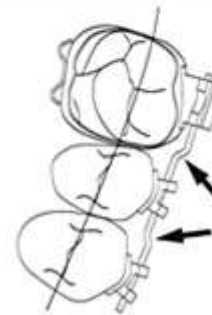
Slots are parallel to each other
all in the same height



Non-Orthos Appliance



Orthos Bracket/Wire System





Roth Straight -Wire technique

Ronald H. Roth

1975 2. Generation SWA brackets

Changes the torque values of the
front brackets

Overcorrectoin!

Functional Occlusion
(Frontguidance)

Correct condylar position



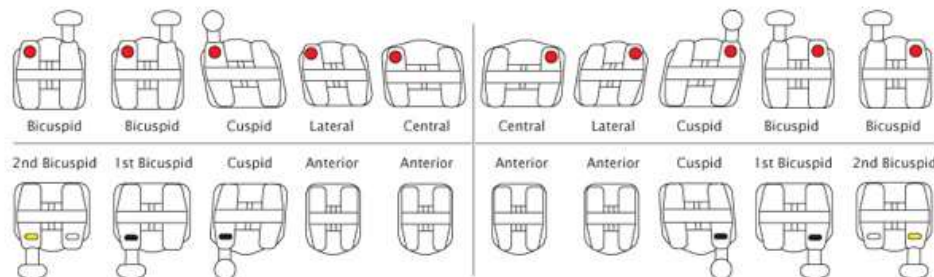


MAXILLARY TORQUE ANG. OFFSET

1 1	Central	+12	+5	0
2 2	Lateral	+8	+9	0
3 3	Cuspid / hook	-2	+13	2
54 45	Bicuspid	-7	0	0
54 45	Bicuspid / hook	-7	0	0

MANDIBULAR TORQUE ANG. OFFSET

21 12	Lower Anteriors	-1	0	0
3 3	Cuspid	-11	+7	0
3 3	Cuspid / hook	-11	+7	0
4 4	1st Bicuspid	-17	0	0
4 4	1st Bicuspid / hook	-17	0	0
5 5	2nd Bicuspid	-22	0	0
5 5	2nd Bicuspid / hook	-22	0	0



Higher incisor torque for class II/2 patients, for front teeth retraction



MBT-technique



McLaughlin

1993-1997 3. Generation SWA System

Modified elements Veränderte Bracket-position

New Ideal-archform

New technique for space closure and anchorage



Bennett



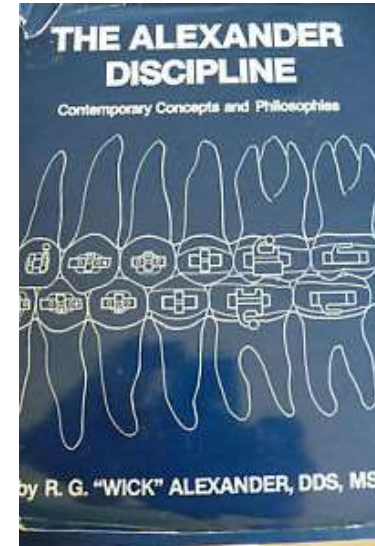
Trevisi

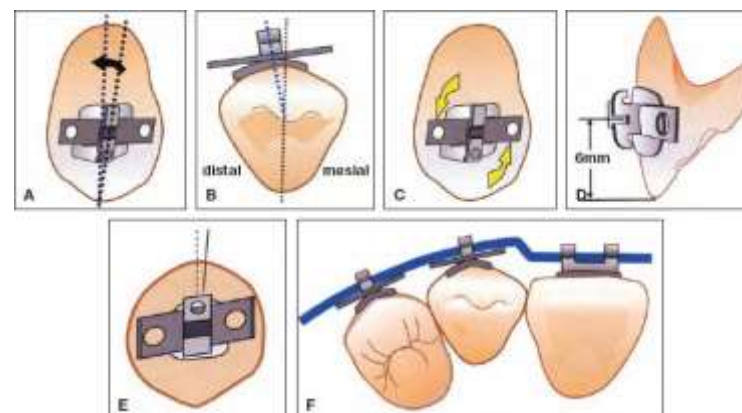
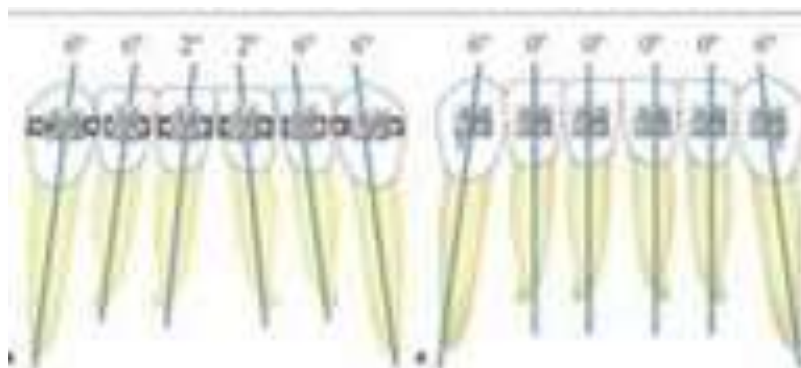
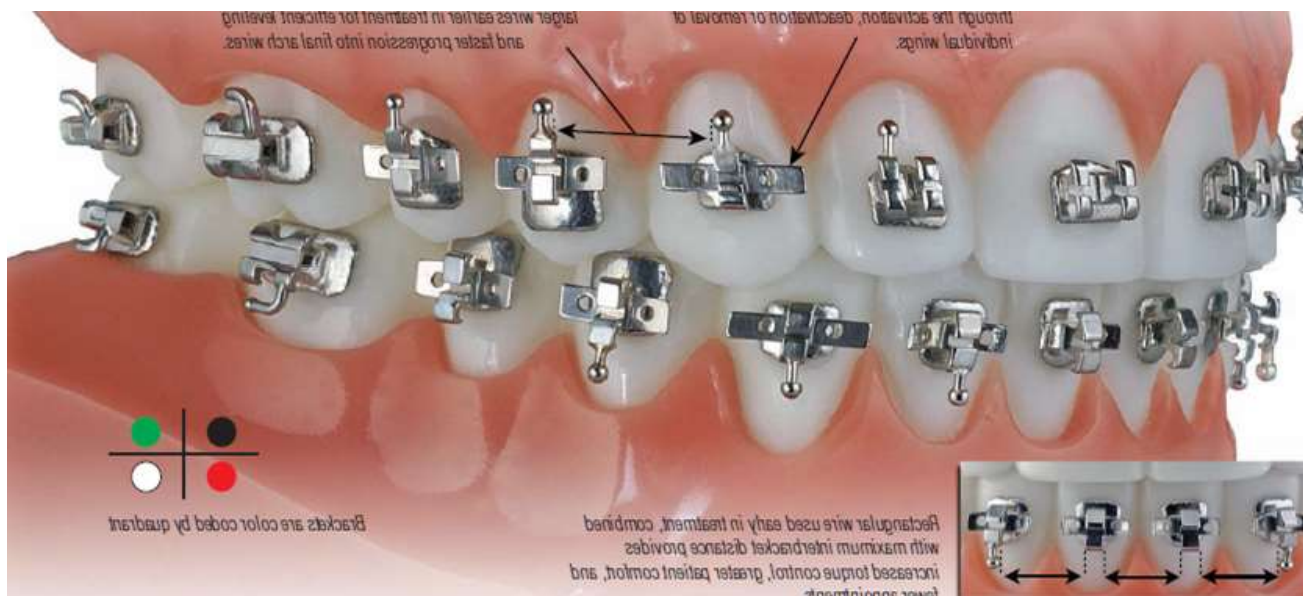


Alexander technique

R.G.Wick Alexander

Twin Brackets on the incisors
Single brackets on the canines
and premolars. The wings are for
better rotation
control. Interbracket distance is
higher







Bidimensional technique

**Schudy and Schudy In
the middle of 70-s
Gianelly 1985**

Slot Incisors 0.018
Distally from canines
0.022 Slot „posterior
play” 0° angulation!

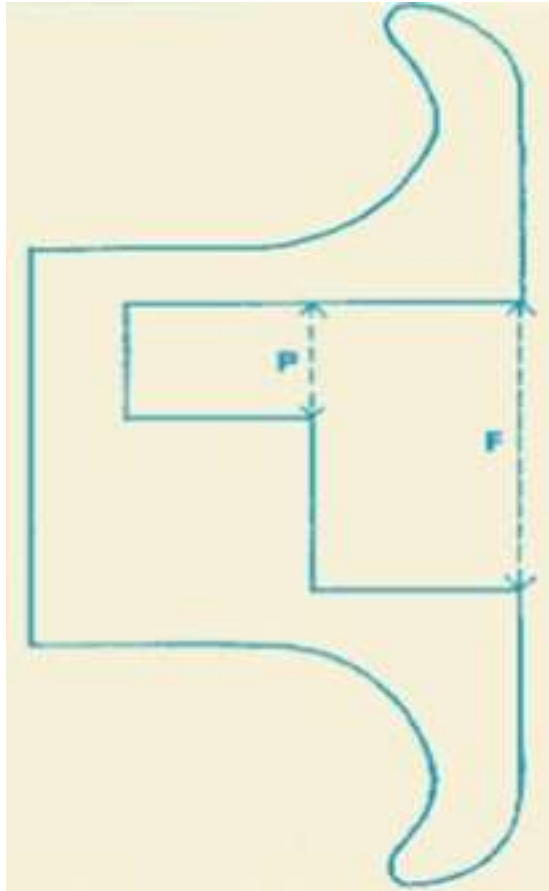


Antony Gianelly

[http://www.bu.edu/today/
2009/in-memory/](http://www.bu.edu/today/2009/in-memory/)

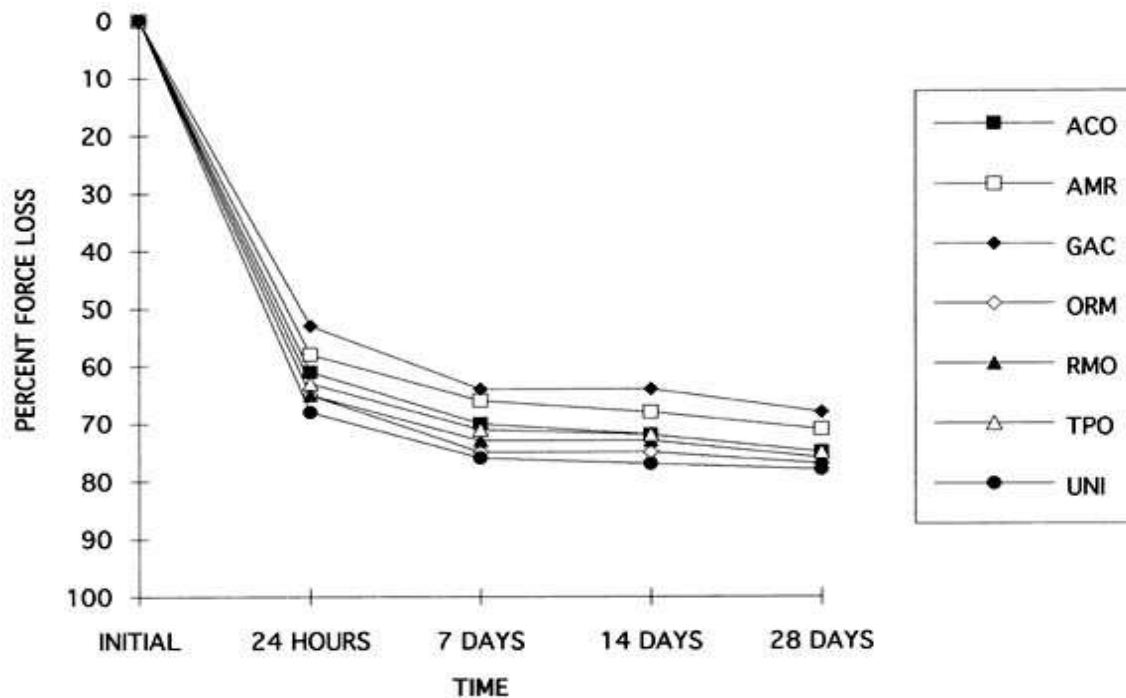


Dual environment bracket





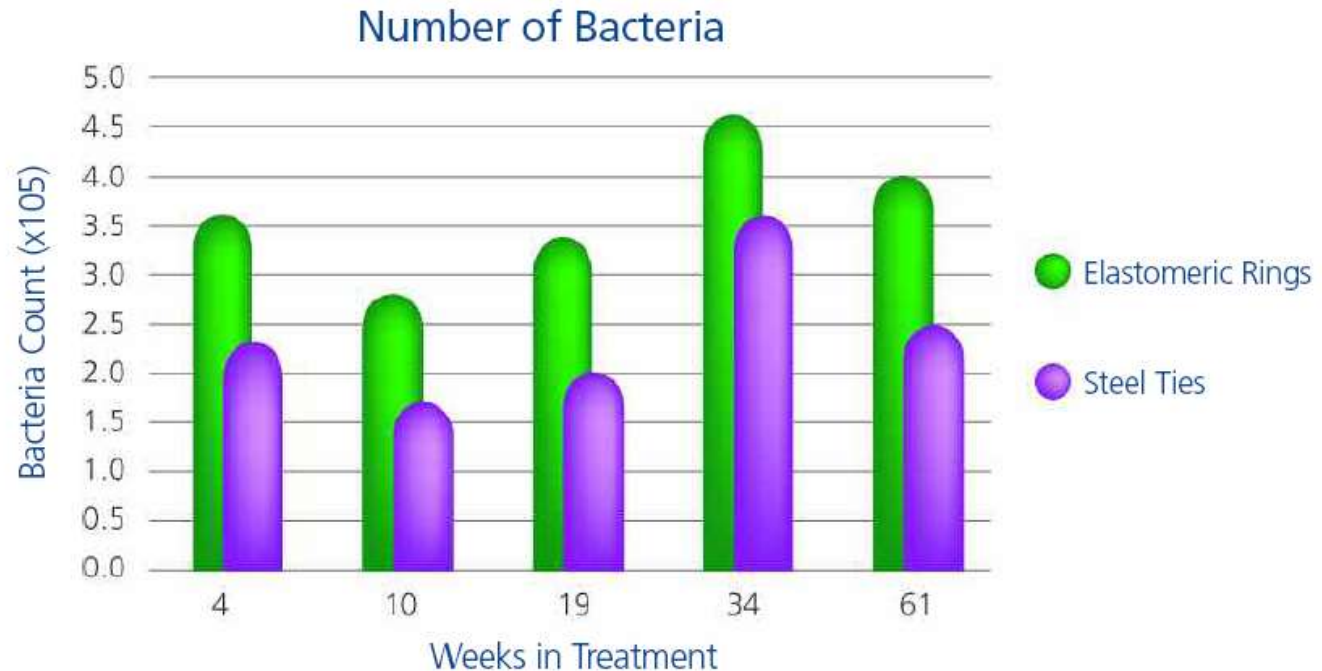
Selfligating brackets



In the first 24 hours the force of the elastic decreases to 60 %



Plaque and bakterial accumulation



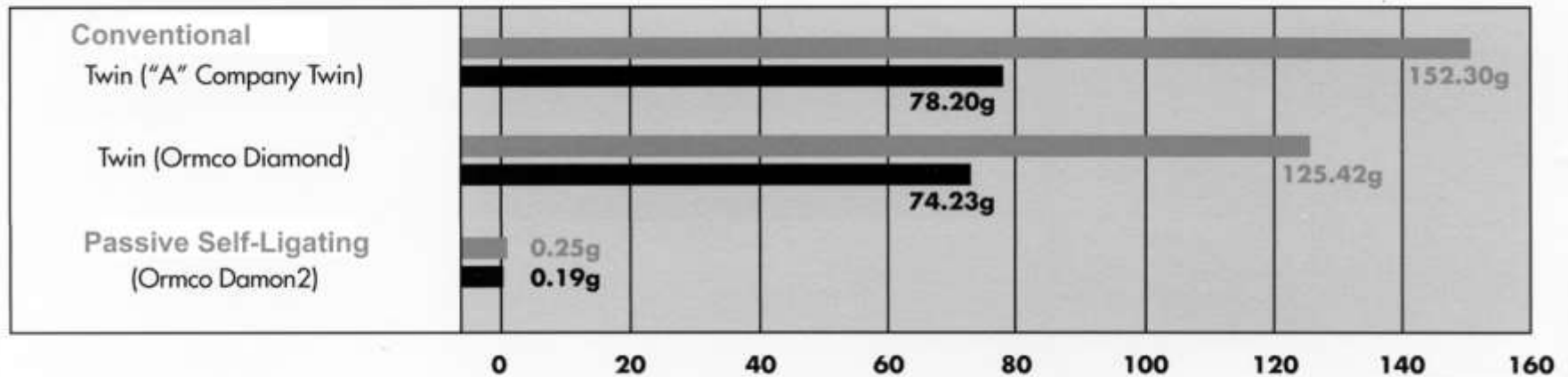
Forsberg et al. Eur J of Orth, pp416-20, Oct. 1991



Friction – in vitro!!!

Friction-Free Relative to Conventional Appliances

■ .019 x .025
■ .020



From Voudouris, AJO 111:119-139, 1997



Selbstligierende Spangen

Russell Lock - 1935

Ormco Edgelok - 1972

Forestadent Mobil-Lock - 1980

Forestadent Begg - 1980

Strite Industries SPEED - 1980

“A” Company Activa - 1986

Adenta Time - 1996

“A” Company Damon SL - 1993

Ormco TwinLock - 1998

Ormco/ “A” Co. Damon 2 - 2000

GAC In-Ovation C – 2000

Gestenco Oyster - 2001

GAC In-Ovation R - 2002

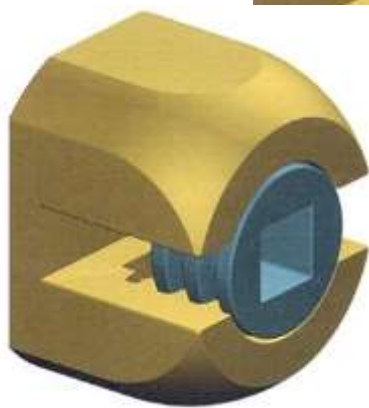
- Adenta Evolution LT - 2002
- Ultradent OPAL - 2004
- **Ormco Damon 3 2004**
- 3M Unitek Smart Clip - 2004
- **Ormco Damon 3 MX – 2005/2007**
- Ultradent OPAL metal - 2006
- Forestadent Quick - 2004
- Lancer Praxis Glide - 2004
- Organisers Carriere LX– 2004
- **Ormco Damon Q –**
- **Ormco Damon Clear –**
- **Ormco Nexus**



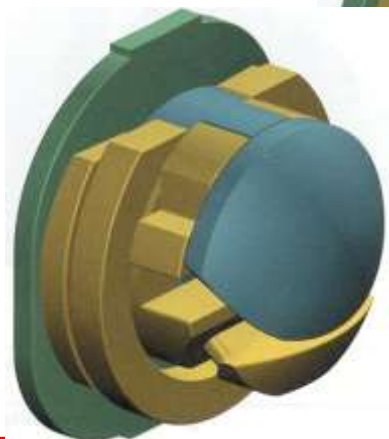
Selbstligierende Spangen



Dr. Jacob Stolzberg 1930
“Russell Attachment”



Dr. Jim Wildman Edgelok
bracket 1971





Damon Bracket

Passive Self-Ligation



Dwight Damon

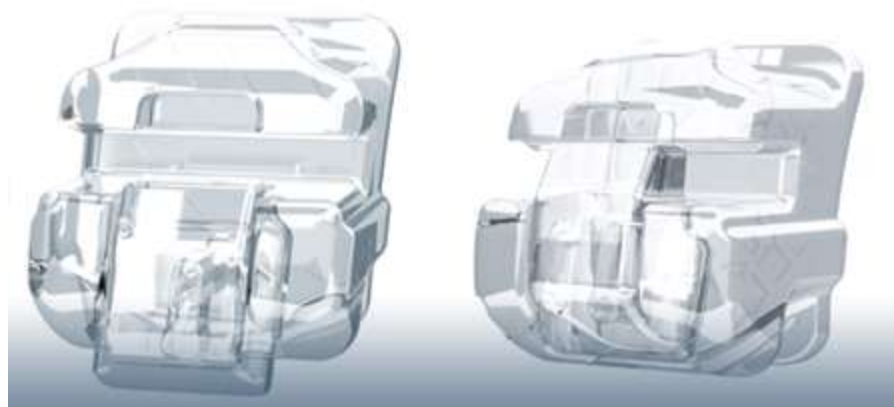
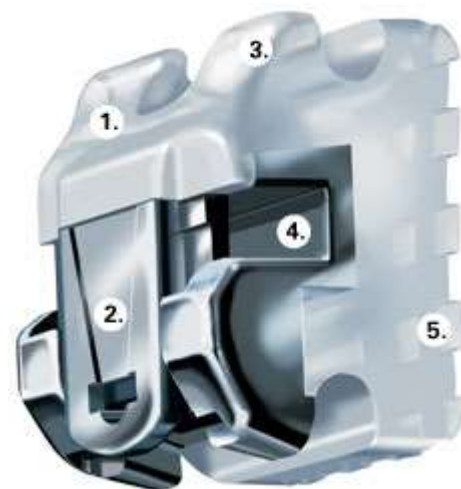


Damon SL, 1993



Damon 2, 2001

Passive self ligation bracket







30-30 Patients

Chairtime decreases-4 seats

Treatment time decreases with 4 mouths

Harradine NW. Clin Orthod Res. 2001 Nov;4(4):220-7.



tion











A prospective randomized clinical trial.

A comparative in-vivo evaluation of the alignment efficiency of 5 ligation methods

Leveling efficiency is better in the initial phase of treatment

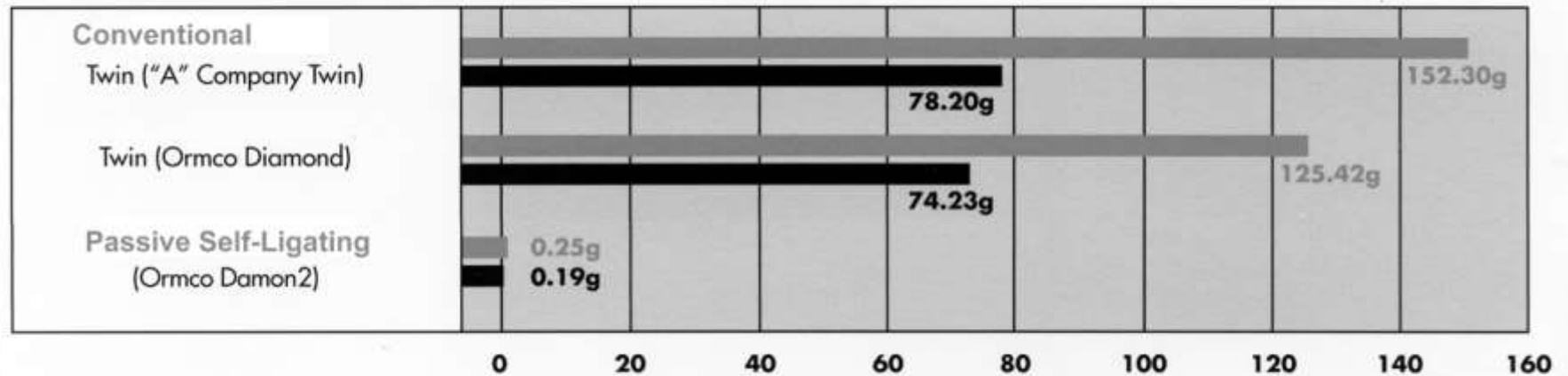
Reddy et al. Eur J Dent. 2014 Jan;8(1):23-31.



Friktion – in vitro!!!

Friction-Free Relative to Conventional Appliances

■ .019 x .025
■ .020



From Voudouris, AJO 111:119-139, 1997



Single-center randomized controlled trial

Comparative assessment of conventional and self-ligating appliances on the effect of mandibular intermolar distance in adolescent nonextraction patients

Intercanine width: Not significant

Intermolar width: Not significant

Length of leveling phase: Not significant

Pandis et al. Am J Orthod Dentofacial Orthop. 2011 Sep;140(3):e99-e105.



PubMed

Display Settings: ☒ Summary, 20 per page, Sorted by Recently Added Send to: ☐

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☐ Systematic review on self-ligating vs. conventional brackets: initial pain, number of visits, treatment time.

1. Čelar A, Schedlberger M, Dörfler P, Bertl M.
J Orofac Orthop. 2013 Jan;74(1):40-51. doi: 10.1007/s00056-012-0116-x. Epub 2013 Jan 10. Review.

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I. Systematic review

Alsó incisor proclination: Significant: 1.5°

Chairtime: Significant

Treatment duration: Not significant

Occlusal characteristic: Not significant

Chen et al. Am J Orthod Dentofacial Orthop. 2010 Jun;137(6):726.e1-726.e18



II. Review

Do you do Damon®? What is the current evidence base underlying the philosophy of this appliance system?

Fájdalom: Nem szignifikáns

Vizitek száma: Nem szignifikáns

Kezelési idő: Nem szignifikáns

Székidő: Nem vizsgálta

Wright et al. J Orthod. 2011 Sep;38(3):222-30.



III. Systematic review

Systematic review on **self-ligating vs. conventional** brackets: initial pain, number of visits, treatment time.

Initial pain: 4, 24 h, 3, 7 day Not significant Vizitek száma: Nem szignifikáns

Treatment time: Not significant

Chairtime: Not detected

Celar et al. J Orofac Orthop. 2013 Jan;74(1):40-51



IV. systematic review.

Leveling efficiency: Not significant

Pain: Not significant

Lost brackets: Not significant

Perio outcome: Not significant

Space closure efficiency: Not significant
Root resorption: Not significant

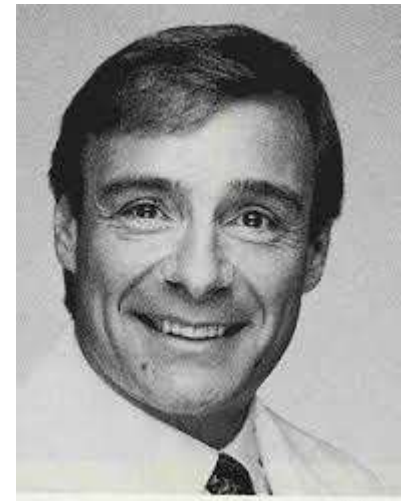
Fleming and Johal, Angle Orthod. 2010 May;80(3):575-84.



Lingvális technika

Craven Kurz

1975- lingually bonded conventional buccal brackets



1976- Ormco – the first lingual edgewise brackets



Lingual bracket

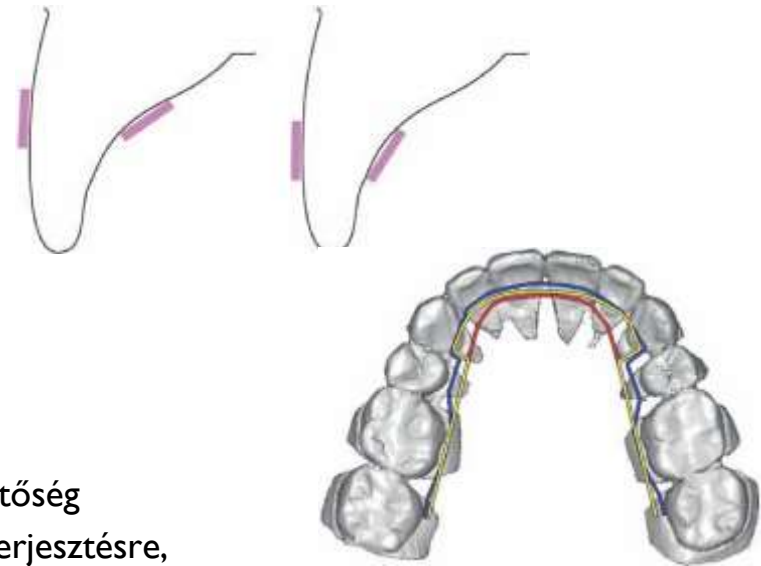


Graber: Contemporary Orthodontics
2012, Ch.18



Main differences to the buccal brackets

1. The lingual surface has higher variability than buccal surface, so average values lead to higher differences
2. Smaller positional change in bracket height lead to bigger torque differences
3. Amennyiben nagyon vastag a lingvális brekett, az jelentősen növeli a diszkomfort érzést. Ez standardizált készülékeknél azért szükséges, mivel az egyenes ívhez csak így tud idomulni a brekett.
4. Az egyénileg kialakított lingvális készülékeknél lehetőség van a brekett talp minél nagyobb felszínre való kiterjesztésre, illetve részben még az okkluzális felszínre is kiterjeszthető. Ez lehetővé teszi a használatát gyermekeknél is (kisebb klinikai korona)
5. Bizonyítottan kisebb dekalifikáció, ha van akkor is kevésbé feltűnő





Gyártási folyamat

1. Kétfázisú szilikon lenyomat

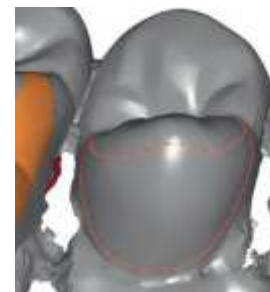
2. Egyéni gipszminta setup a fogtechnikai laborban, a kezelőorvos által megadott kezelési terv alapján.

3. A setupolt gipszminta 3D szkennelése
20 µm-es pontossággal.

4. A brekettek tervezése (digitálisan)

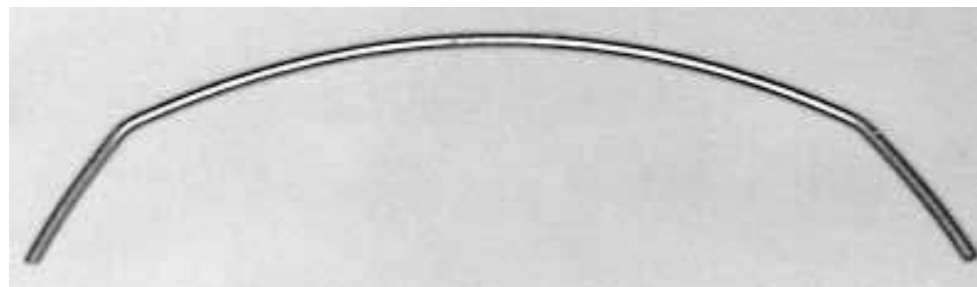
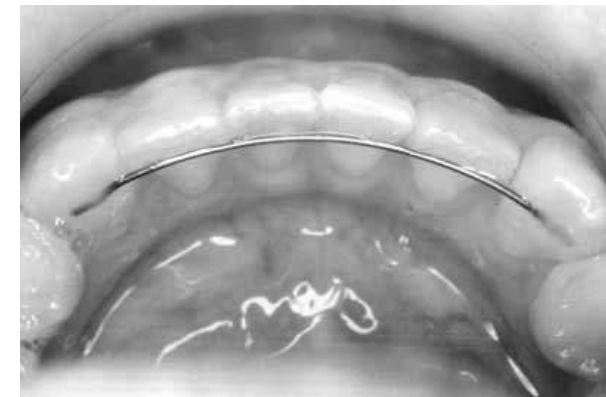
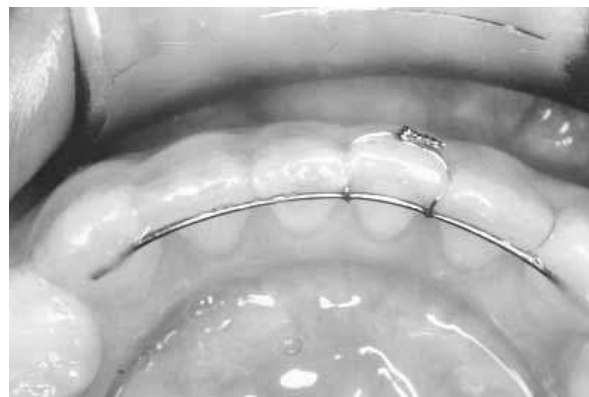
5. A brekett testét (megtartva az előzőleg tervezett slot síkját) digitálisan összehozzák a brekett bázissal.
Célja, hogy a slot-ot minél közelebb vigye a fogfelszínhez.
A gombocskák szárnyacskák egyénileg föltehetők minden brekettre.

6. Az egyéni íveket egy ívhajlító CAD kontrollált robot hajlítja meg









Liou et al. AJODO, 2001 April;119:443-9