Bracket Selection

Begin With The End in Mind

Bracket Selection

What

The process of choosing the bracket torque value suitable for each tooth with no matter for which tooth or which company bracket manufactured and no exception even SL brackets. The selection must accordance with the mechanic to be used either protraction or retraction (CI1,2,3 mechanics) in the treatment to achieve the desired final RWT (Real Work Torque) corresponding to the norm of that tooth

Why

Since during the tooth movement, there must be “ torque play” inevitably in the tooth movement system. The final RWT never meets the torque needed after orthodontic treatment. No other brackets manufacturing company can produce a bracket that can be used in any situation of tooth movement.

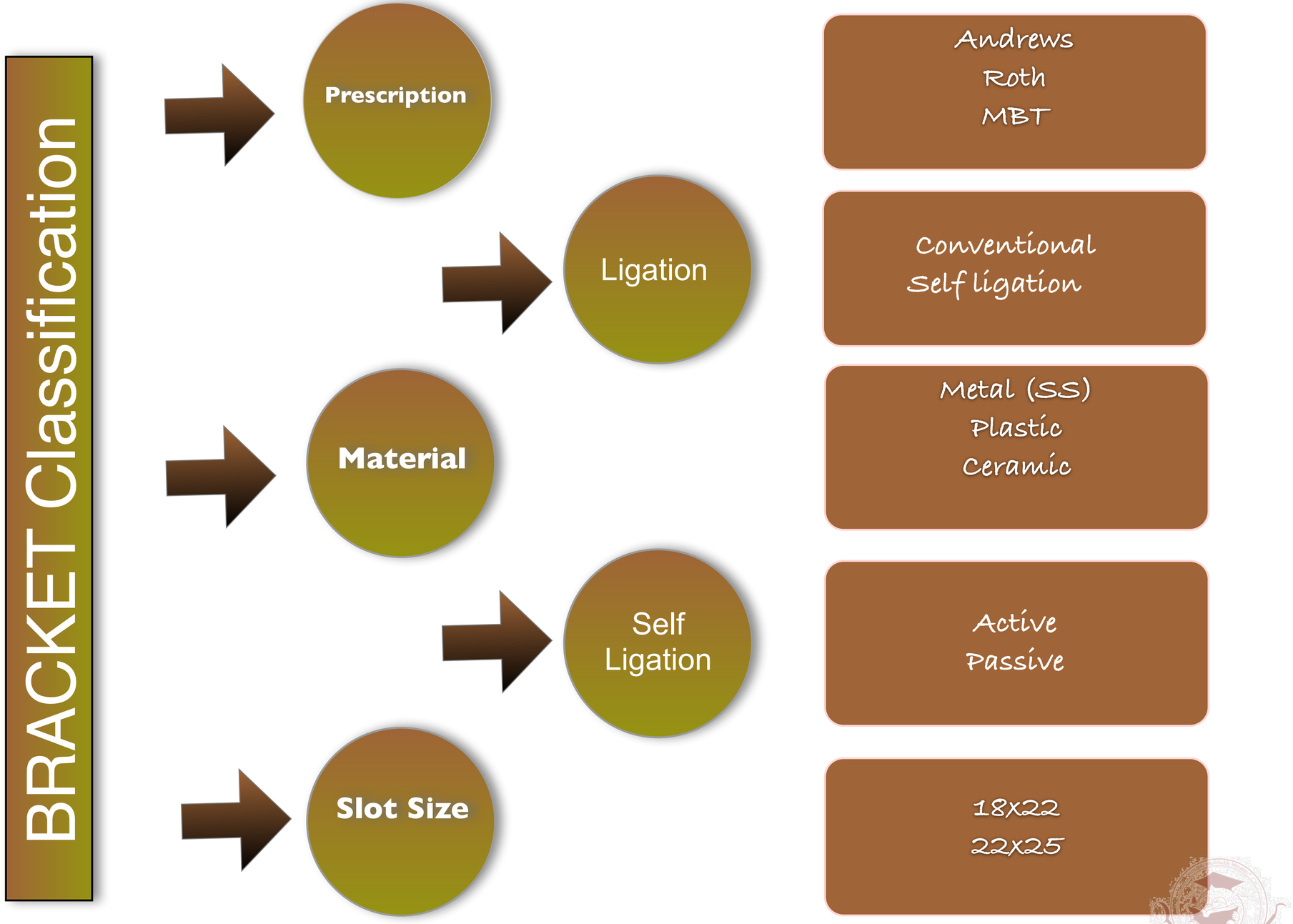
Straight
Wire Bracket

Technique

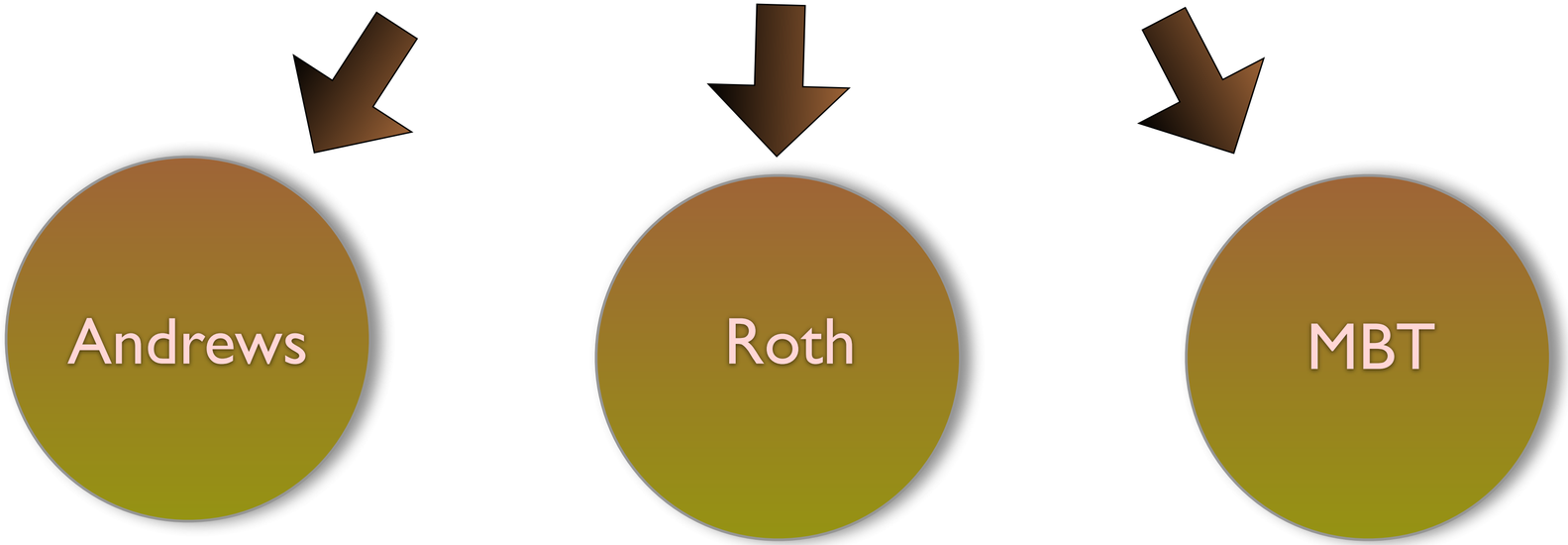
Appliance

Straight wire Appliances

Putting part of treatment to the brackets
(tip, torque rotation, in-out, offset)


BRACKET Classification
Prescription
Andrews
Roth
MBT
Ligation
Conventional
Self ligation
Material
Metal (SS)
Plastic
Ceramic
Self
Ligation
Active
Passive
Slot Size
18X22
22X25

Prescription Classification



Andrews	Roth	MBT
Normal Occlusion Treated cases Non Extraction No over correction	Non Sliding Mechanic Over correction Extraction	Sliding Mechanic Extraction

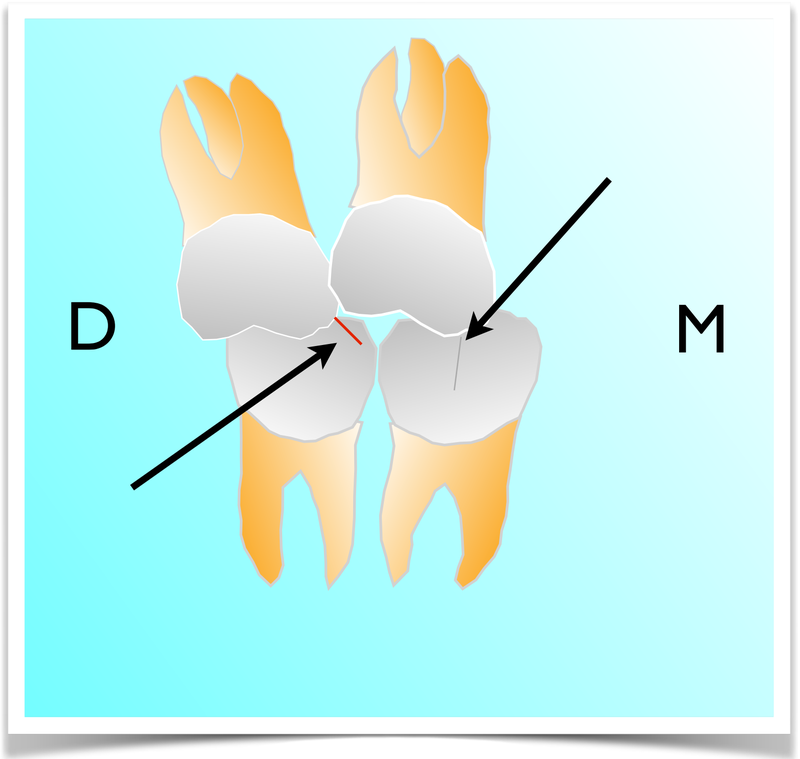
Six Keys to Normal Occlusion

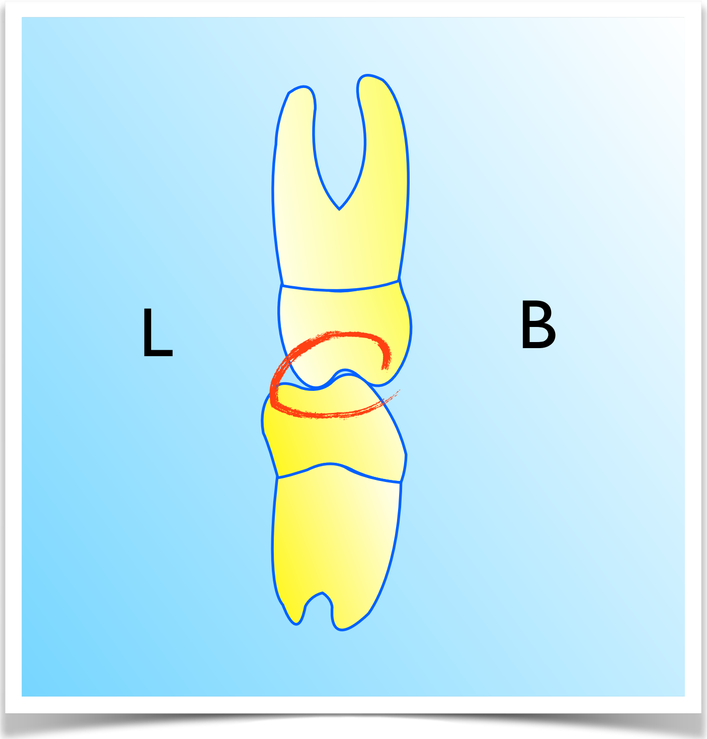
Lawrence F. Andrews

Six Keys to Normal Occlusion

- Inter arch (Molar)relationships
- Crown Angulation
- Crown Inclination
- Rotation
- Proximal Contact
- Curve of Spee

I. Inter arch relationships



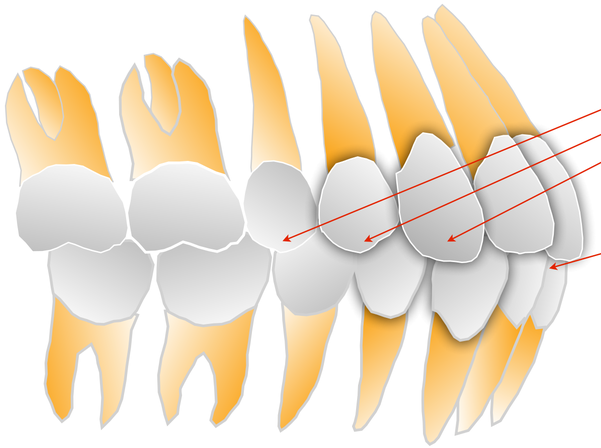


-MB cusp of 6/- to B groove of -/6

-DB cusp of 6/- to
M inclined plane of MB of -/7

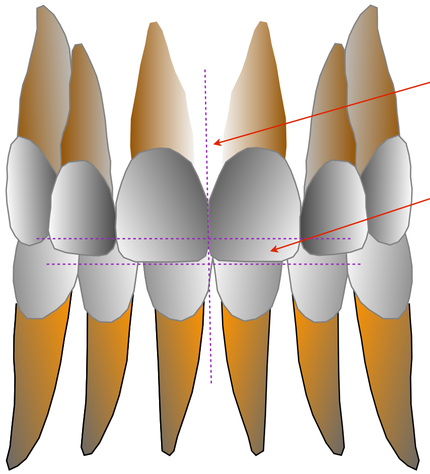
-ML cusp of 6/- to central fossa of -/6
-Middle B cusp of -/6 to
central fossa of 6/-

I. Inter arch relationships



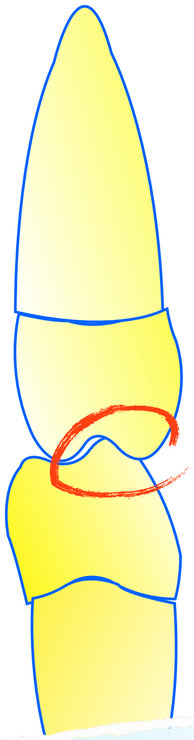
B cusp of 3,4,5 /- to embrasure of -/ 3,4,5,6

Over jet 3mm.



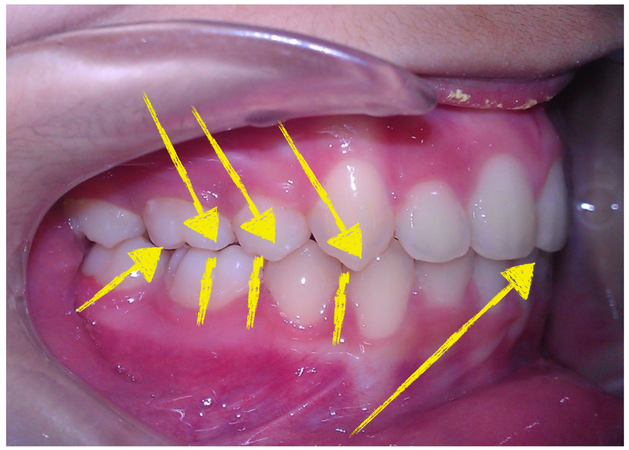
Midline - on

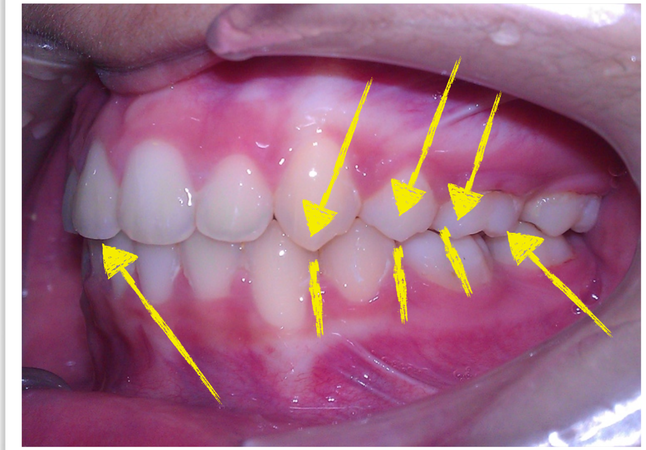
Over bite (20-30%)

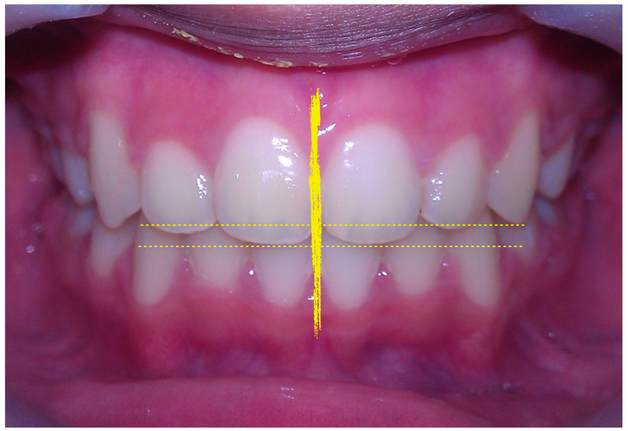


-L cusp of 4,5/- to fossa & embrasure of -/4,5
-Middle B cusp of -/6 to fossa & embrasure of 5,6/-

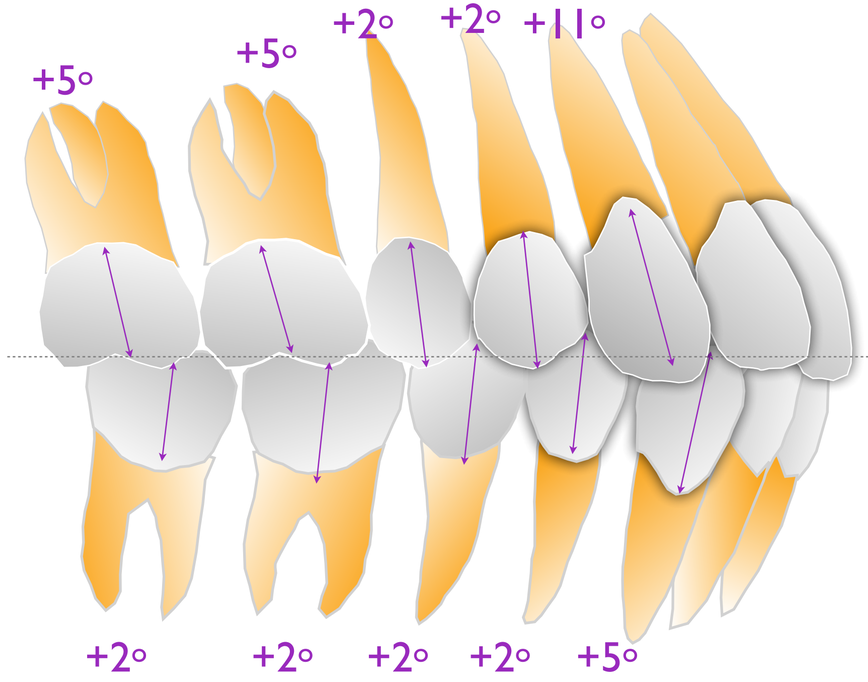
Inter arch relationships

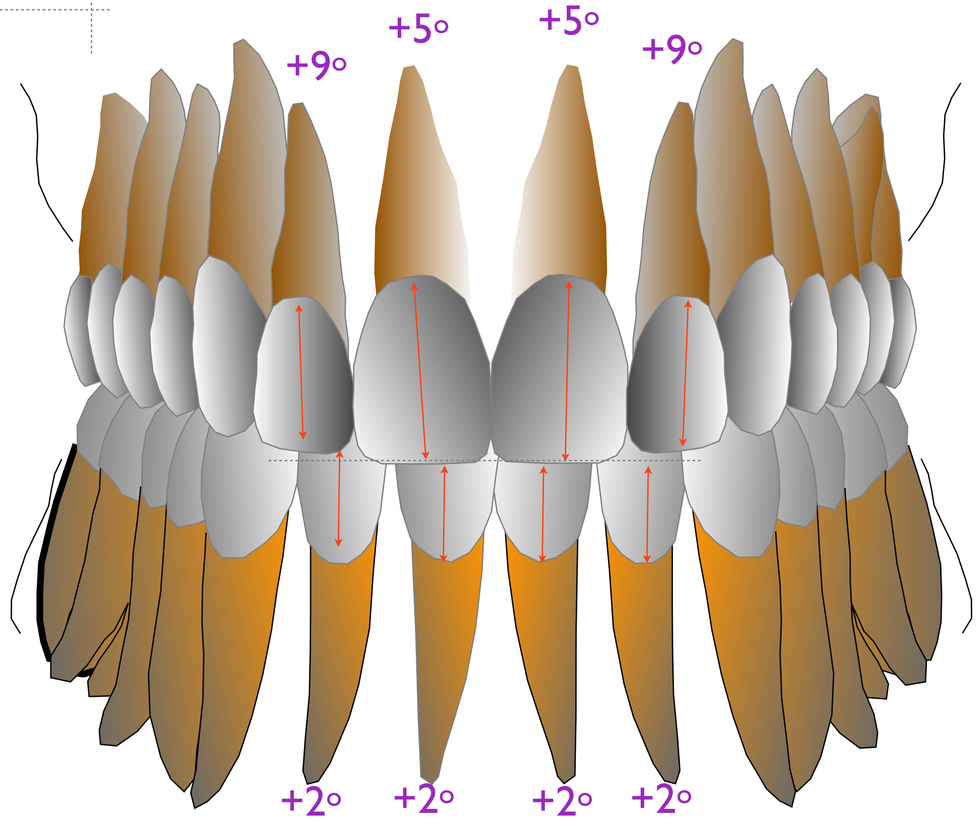




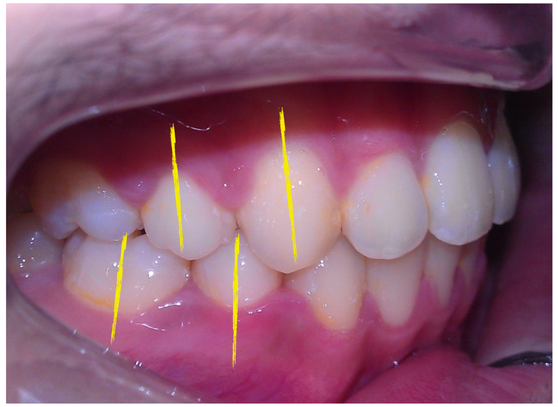


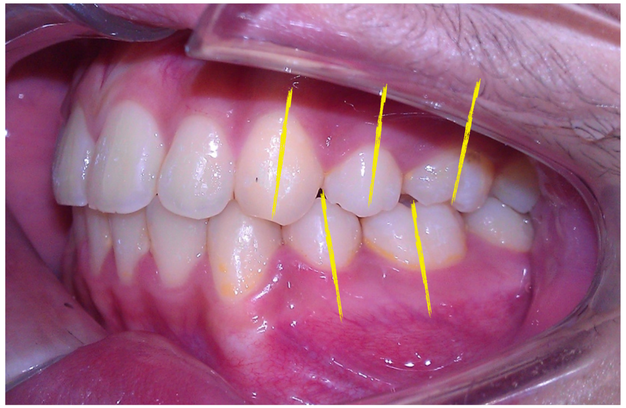
Key.II Crown Angulation (Tip)

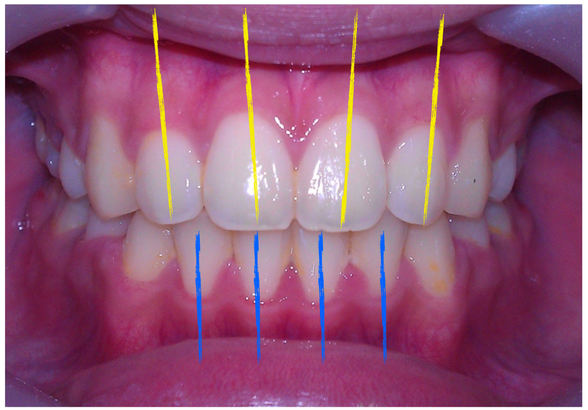




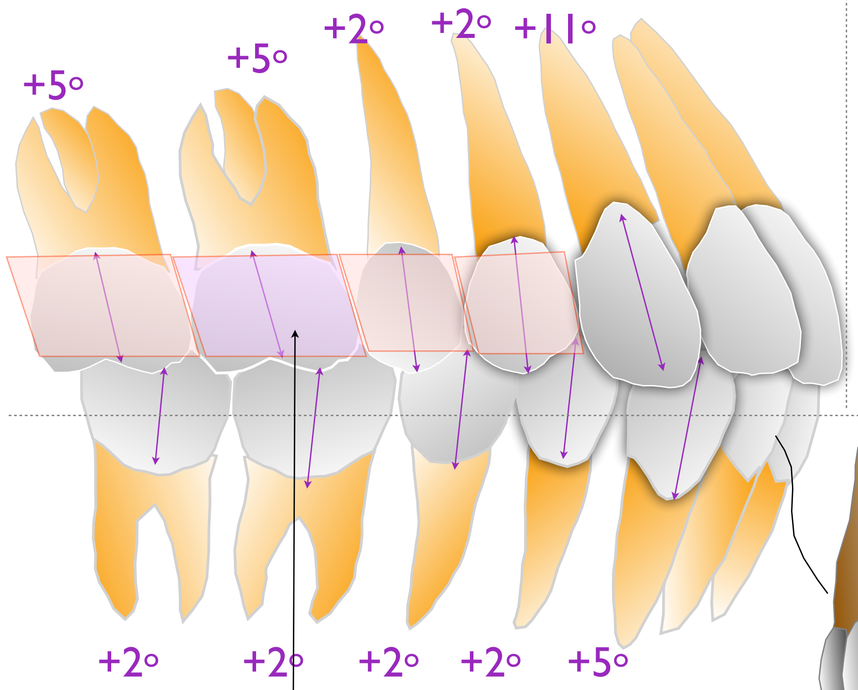
Crown Angulation

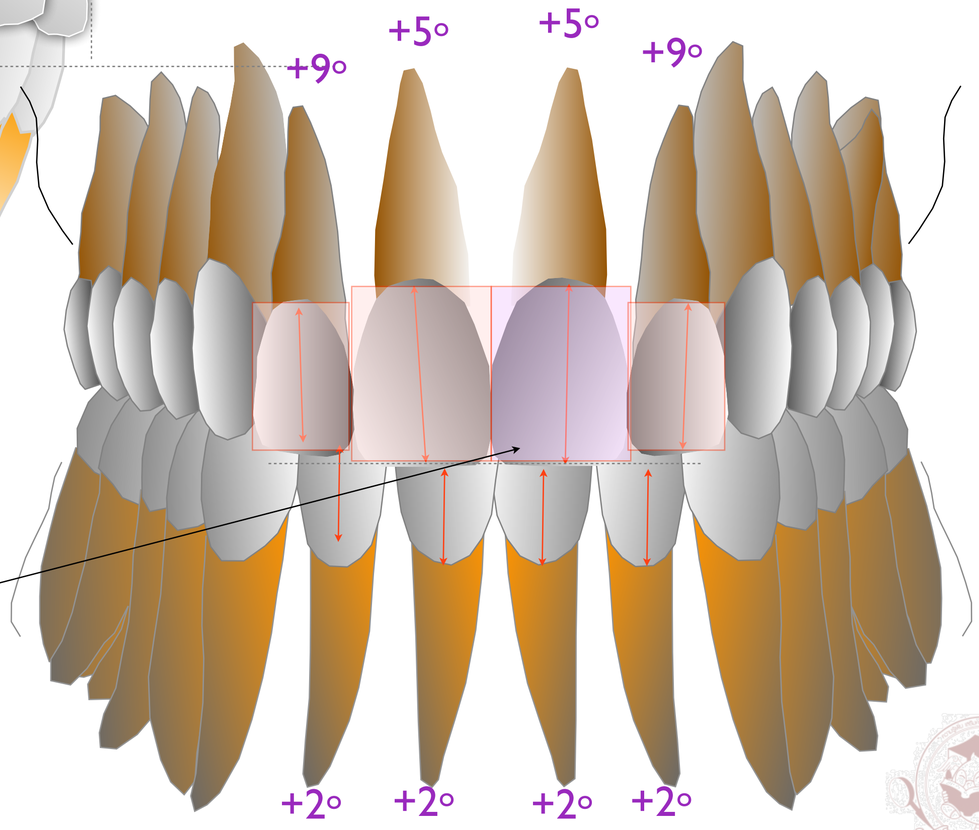




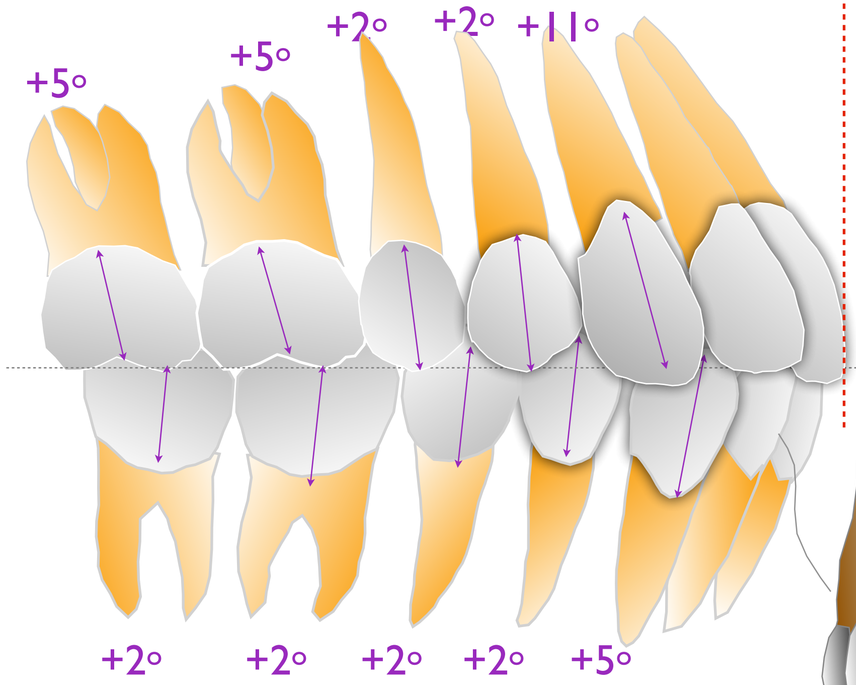


Improper Crown Angulation

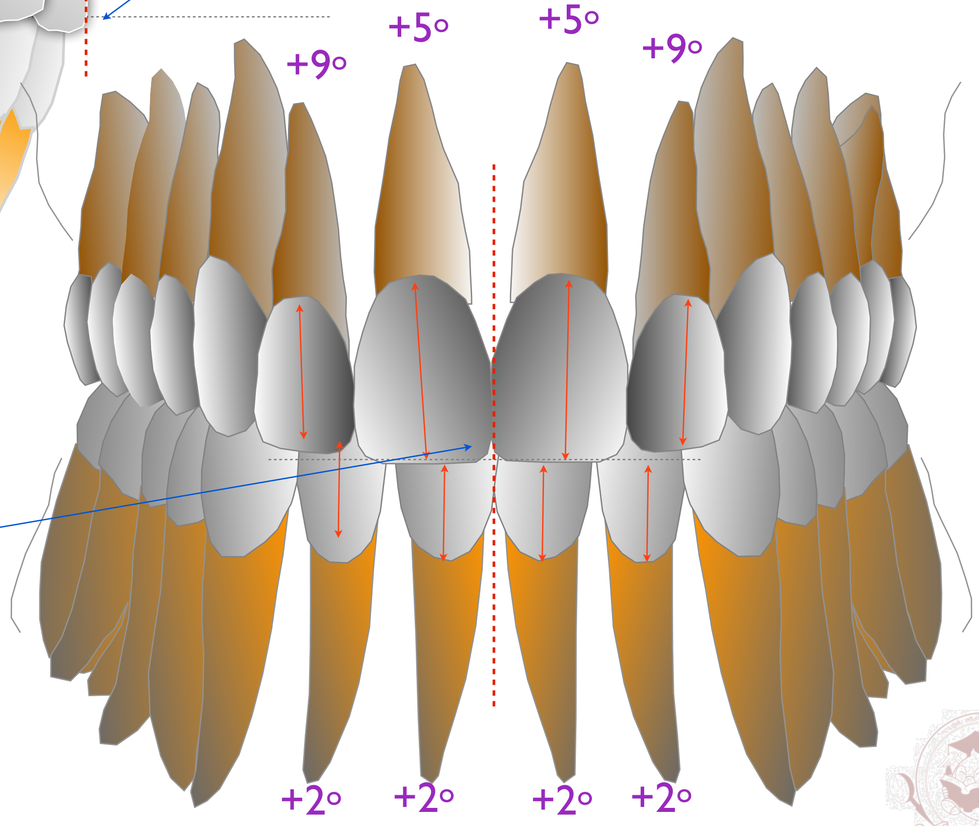




TSD Alike

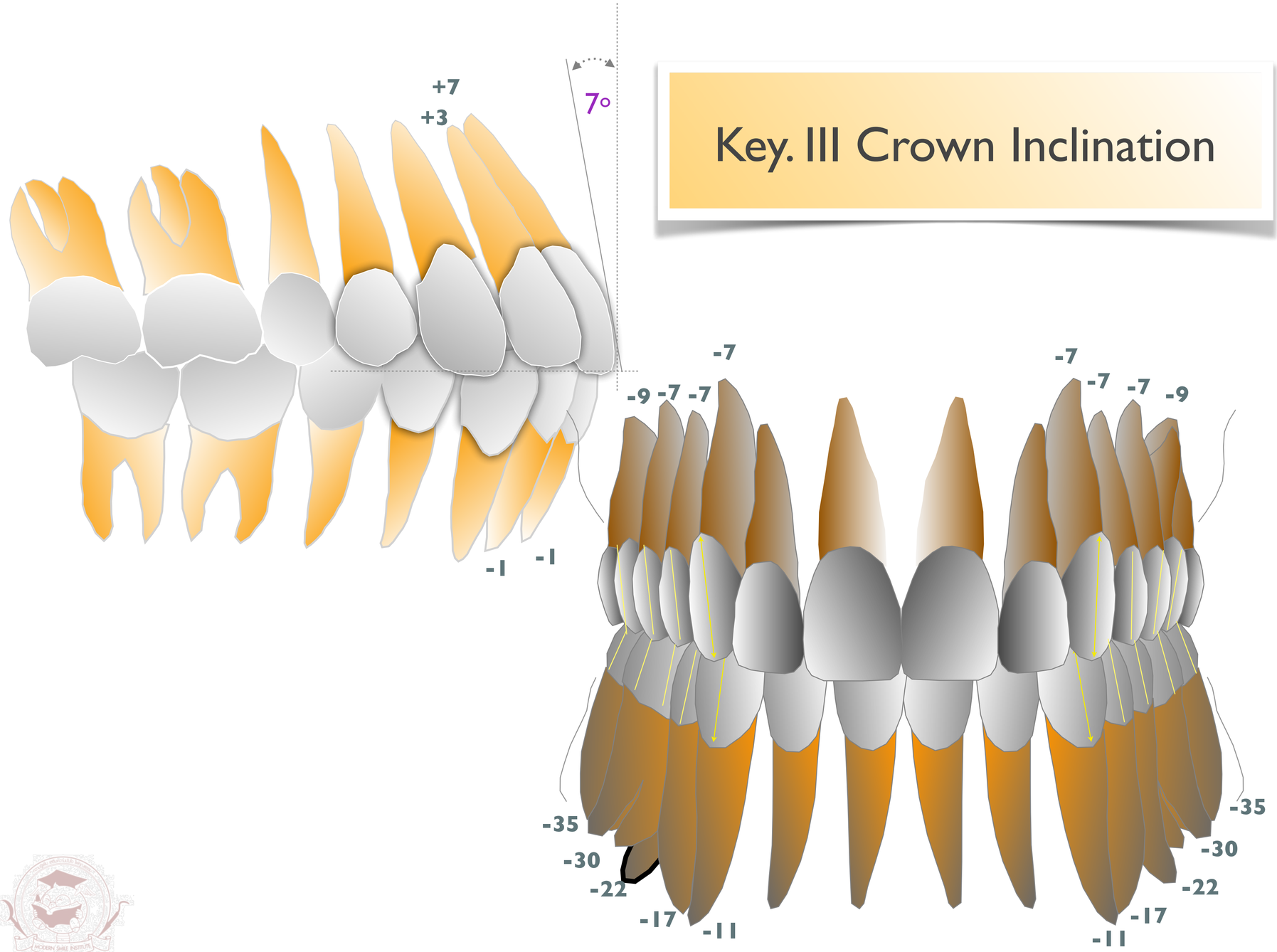


Increased over jet

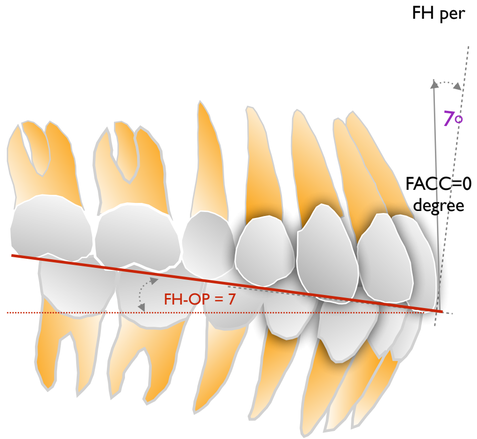


Midline deviation

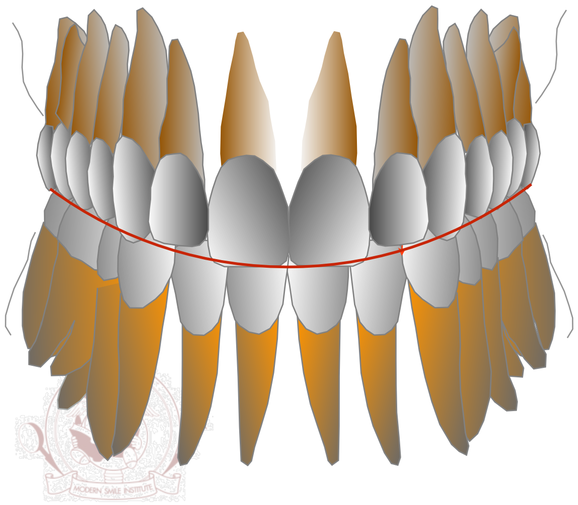
Key. III Crown Inclination

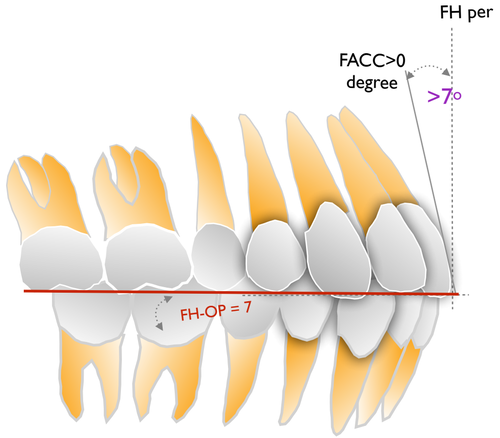


Smile Line

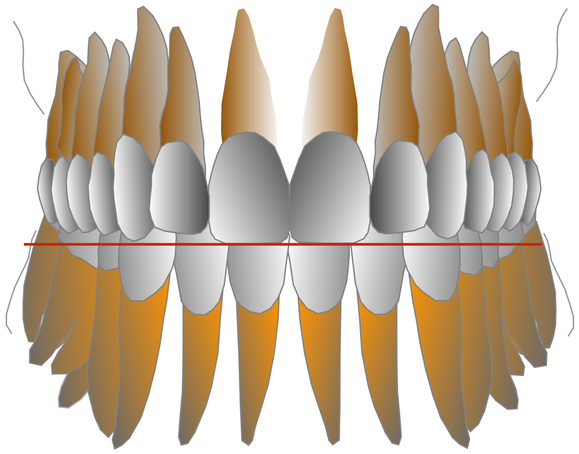


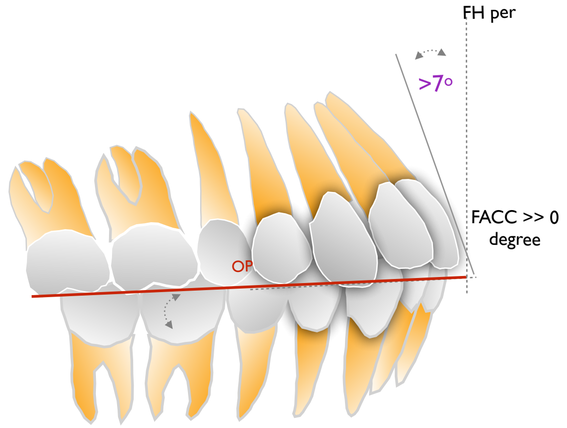
Arch (V)



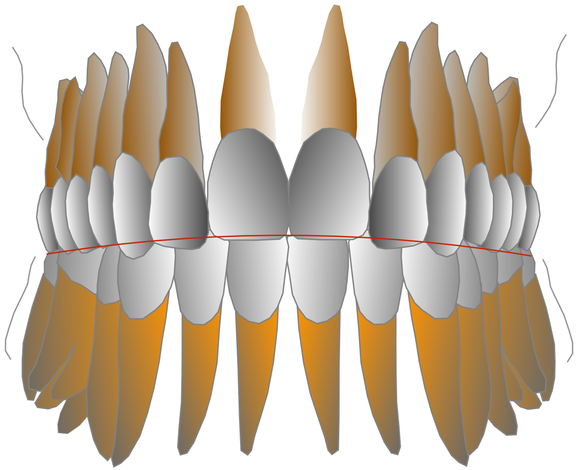


Flat (Ortho Smile)

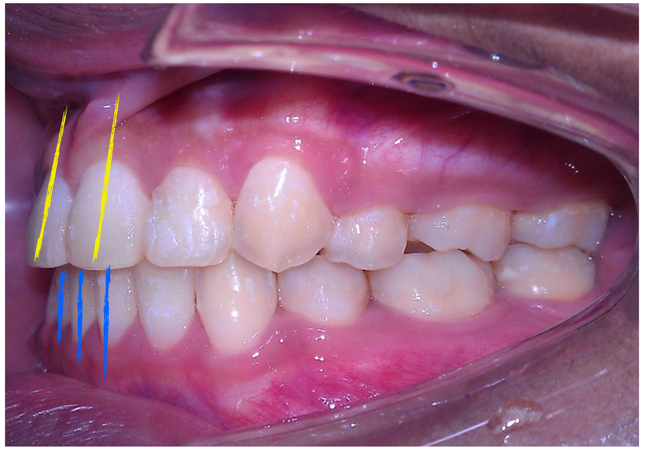


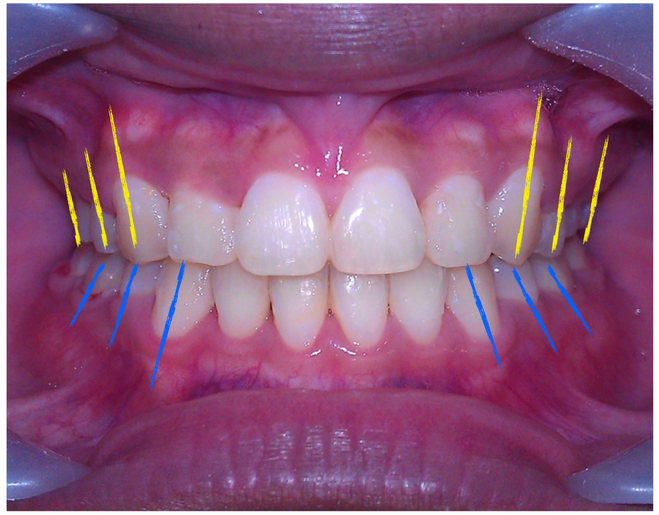


Reverse

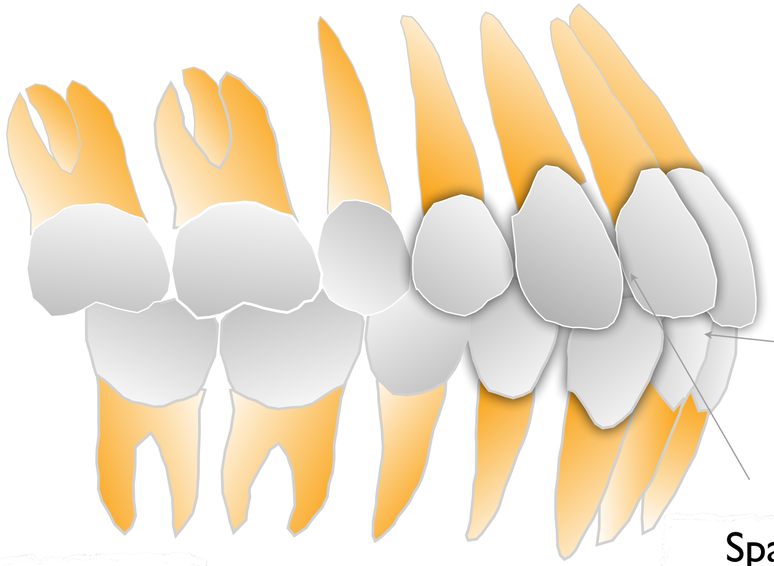


Crown Inclination





Improper Crown Inclination

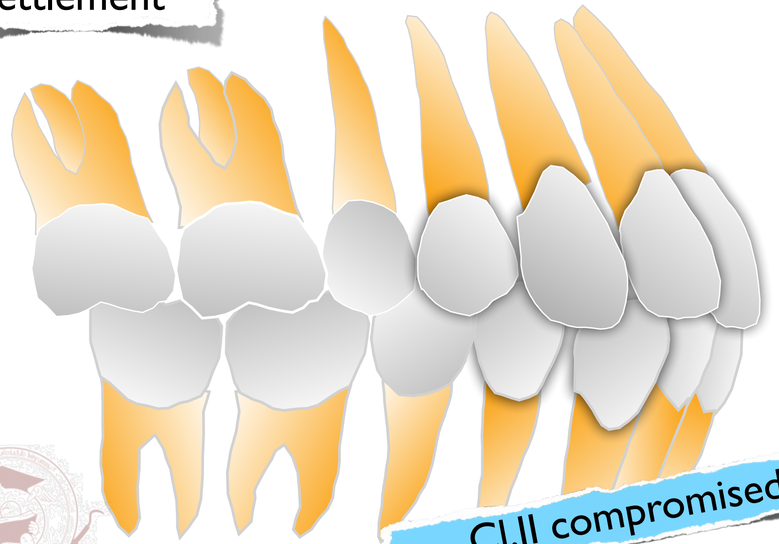


Poor buccal settlement

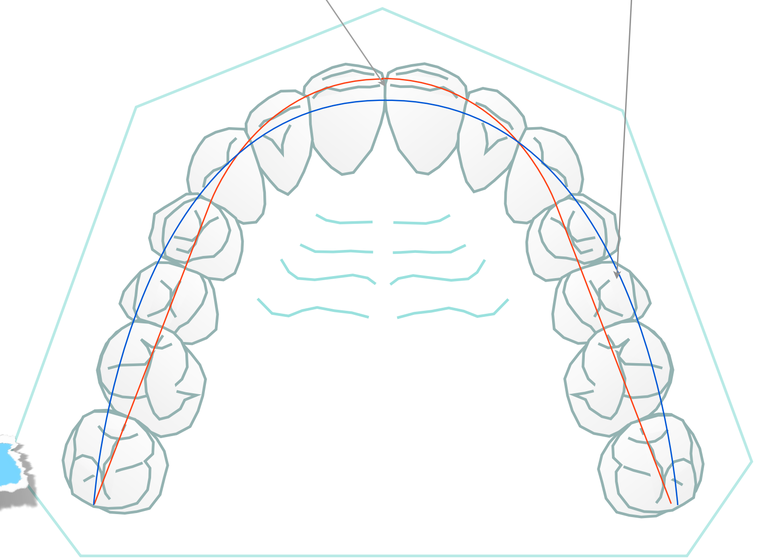
Spacing

Decreased Over jet

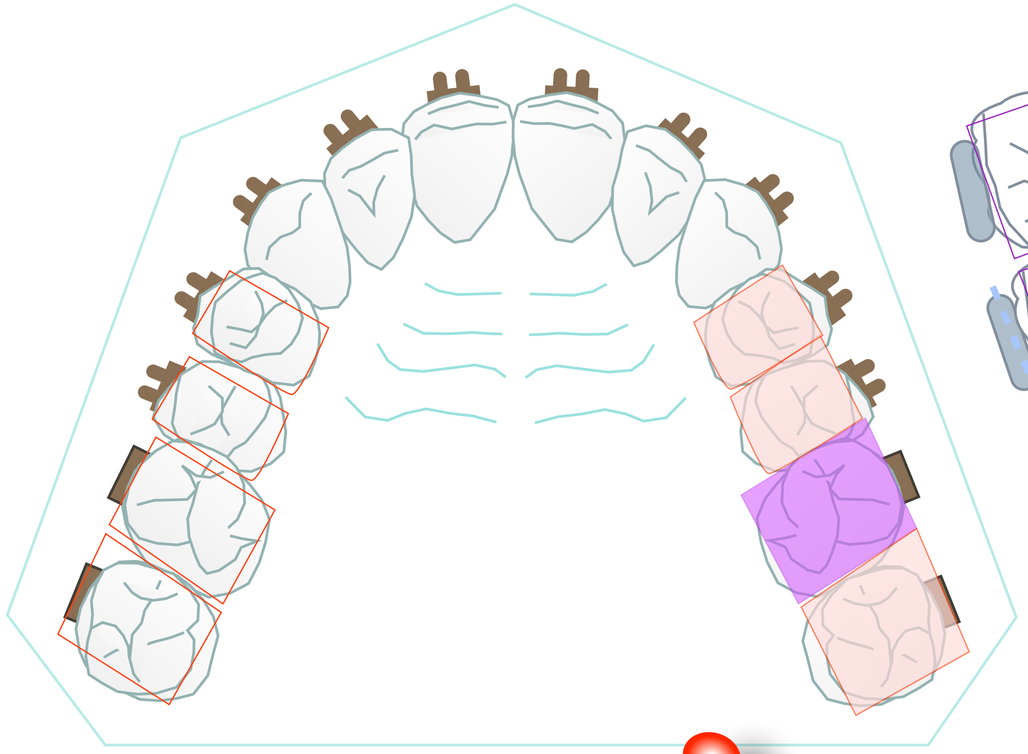
Increased buccal over jet

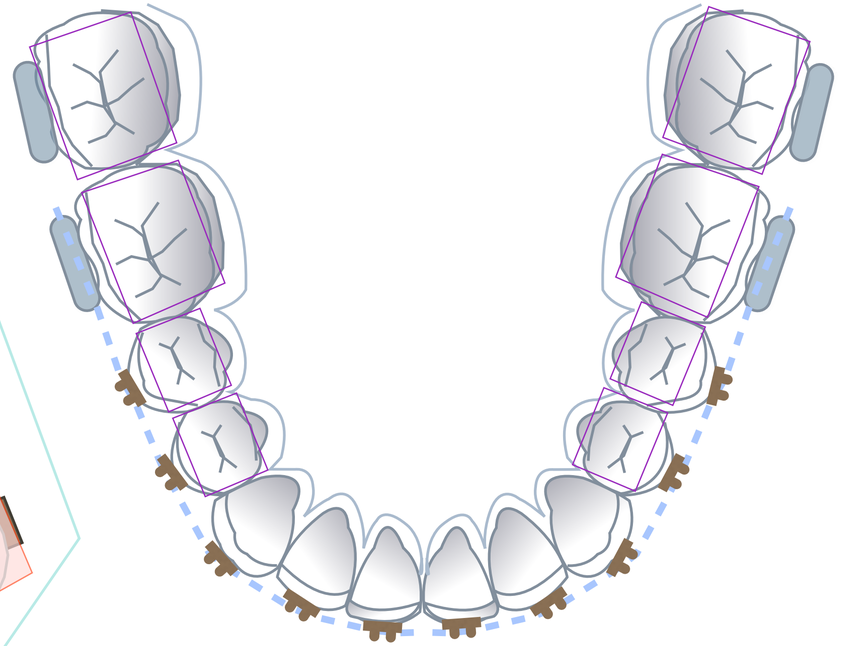


Cl.II compromised cases



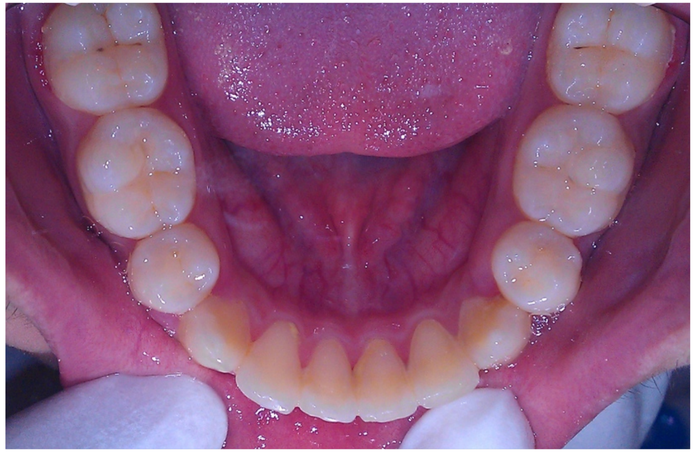
Key. IV,V Rotation & Tight Contact



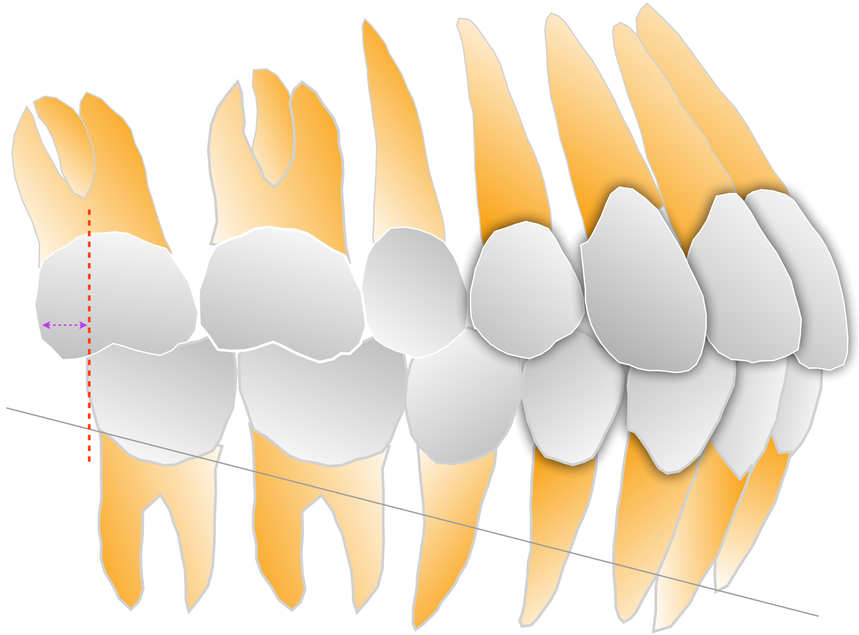


TSD Alike

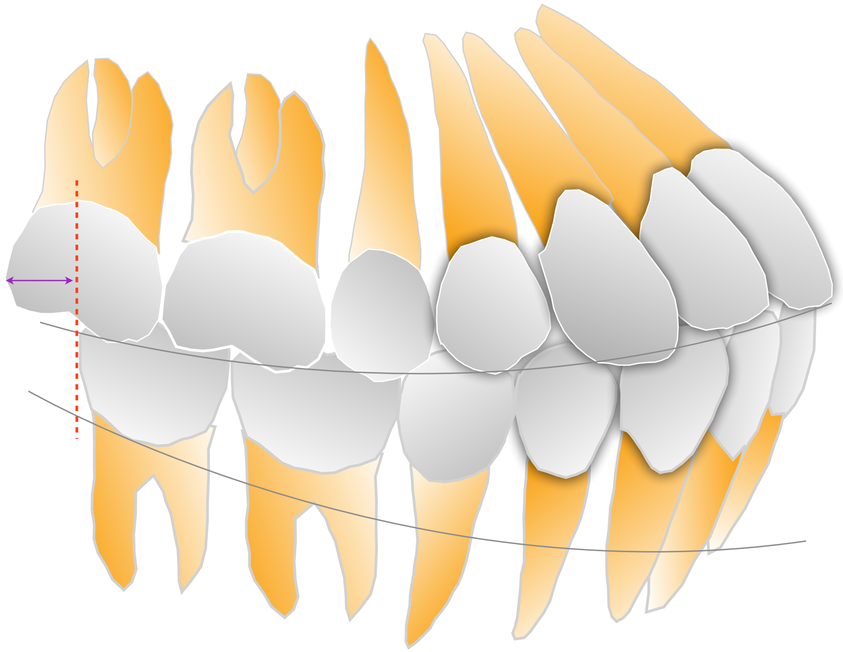
Rotation & Tight Contact



Key V.I Curve of Spee



Deep Curve of Spee



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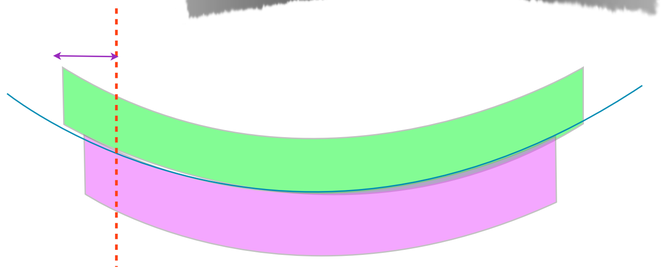
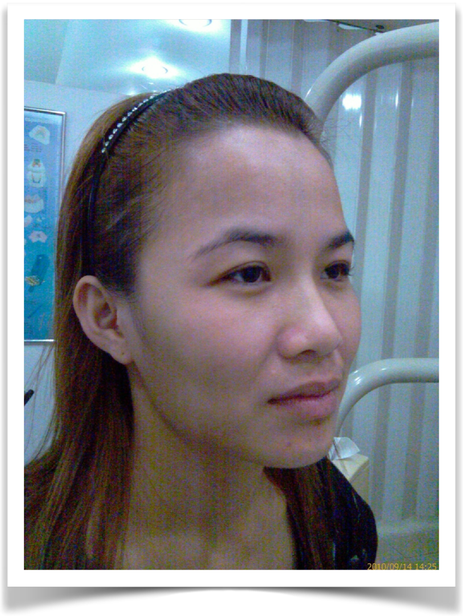
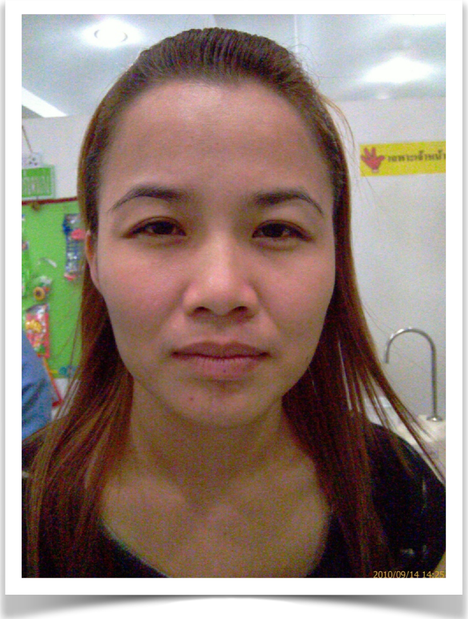
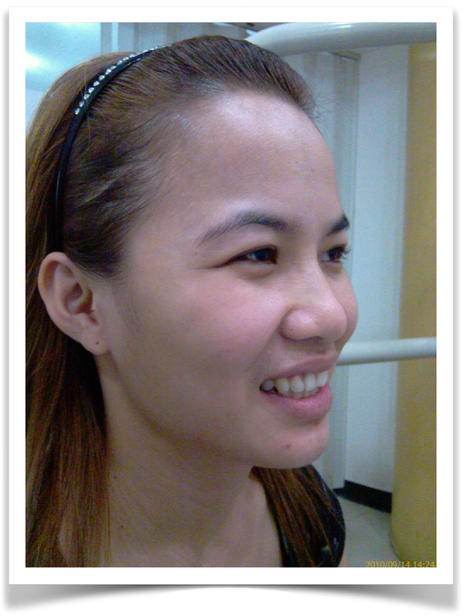
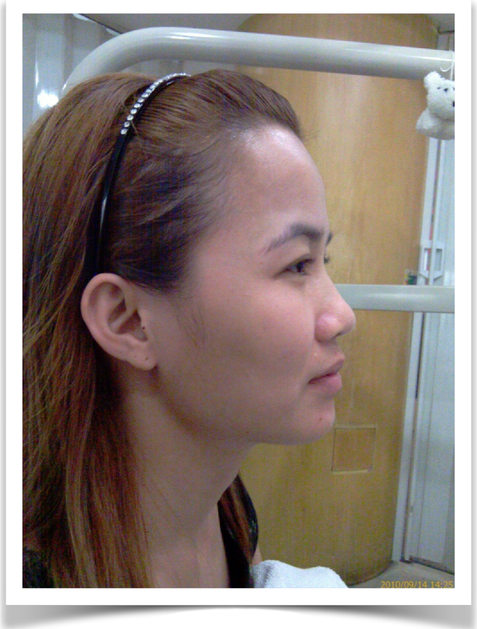


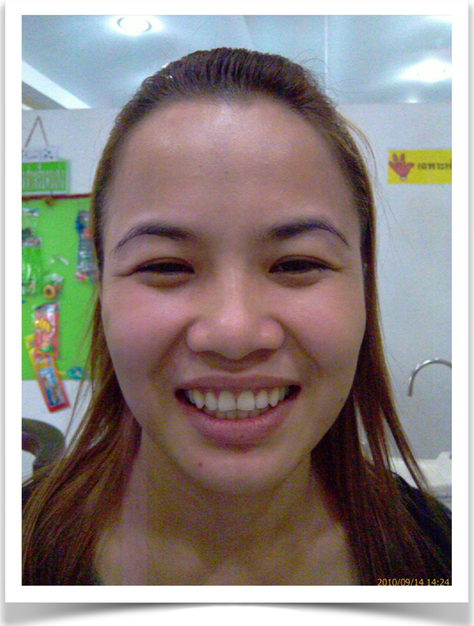
Cl.III

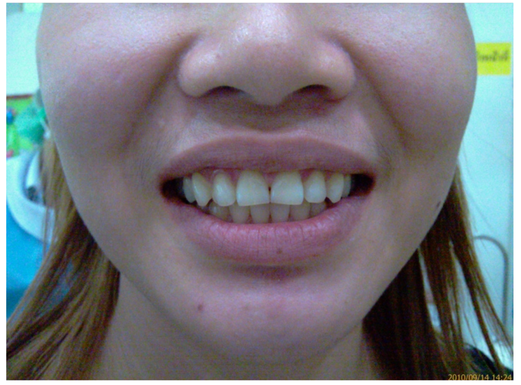


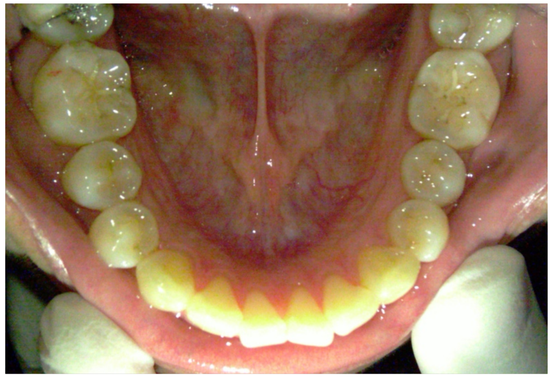


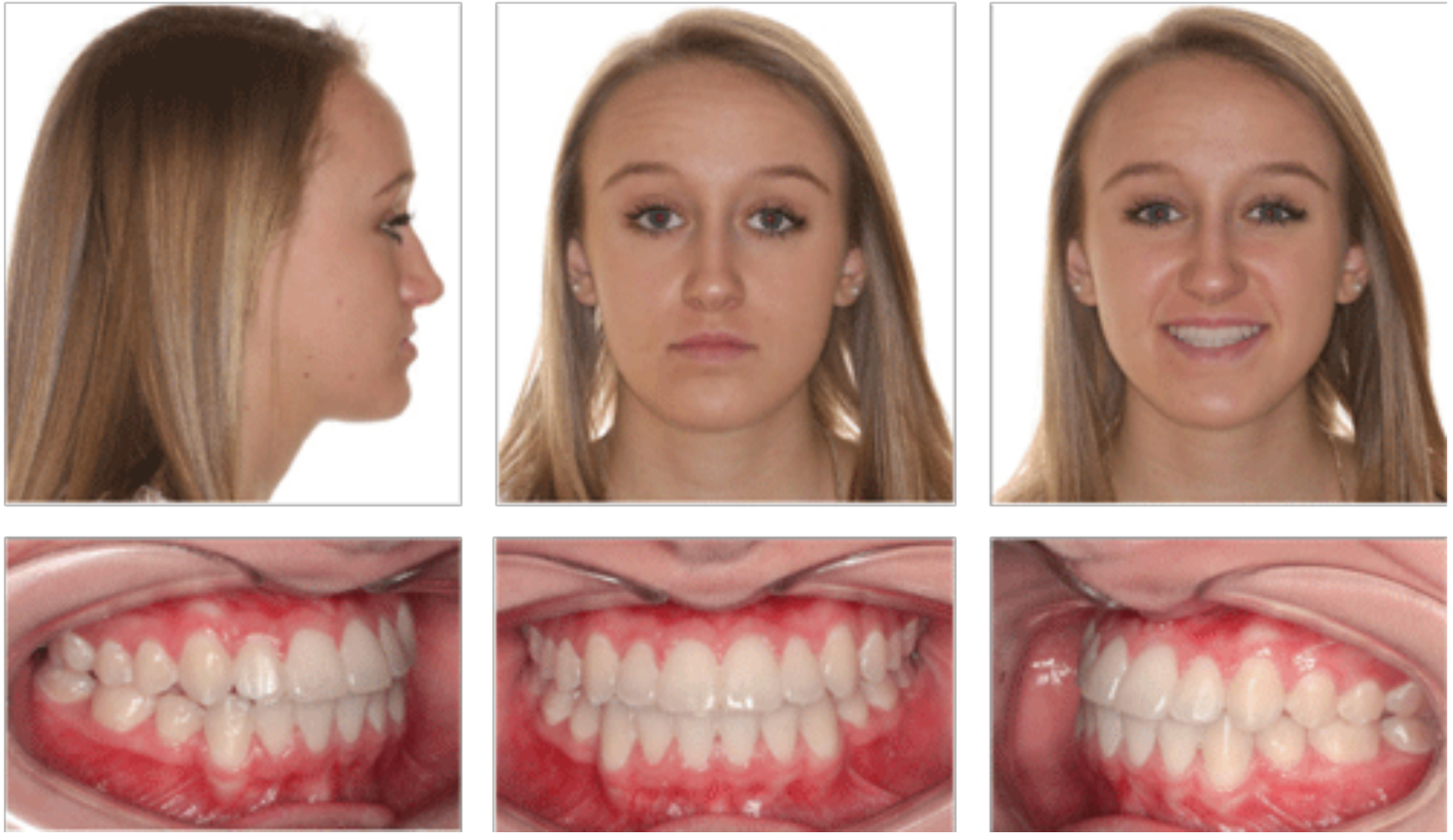




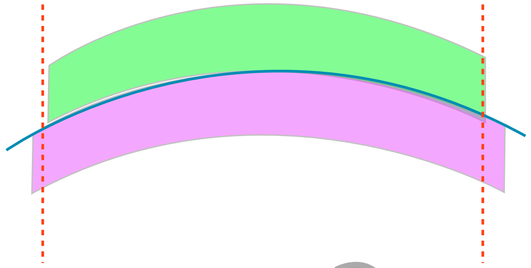






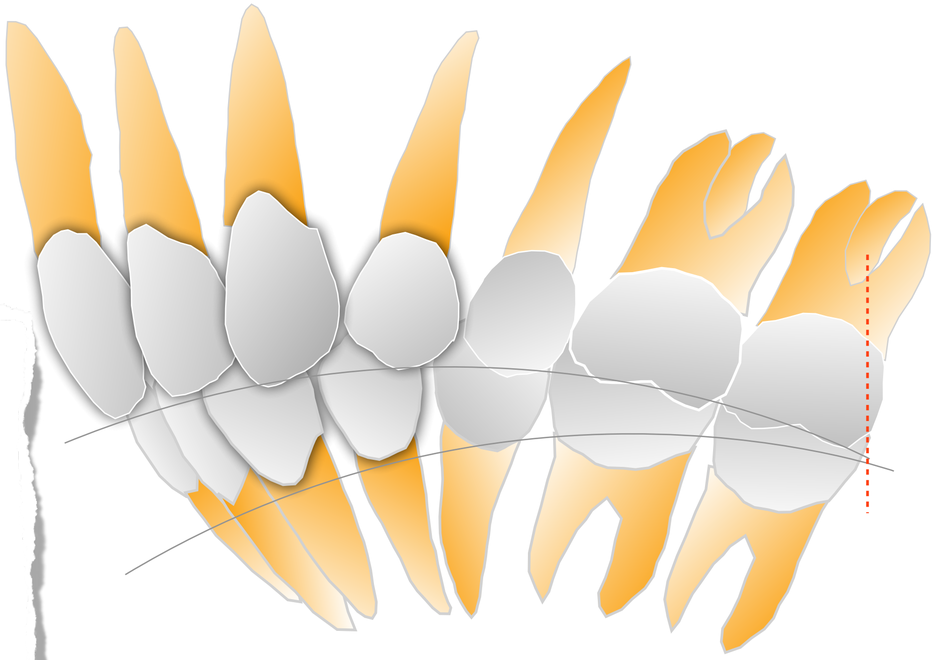


TSD Alike

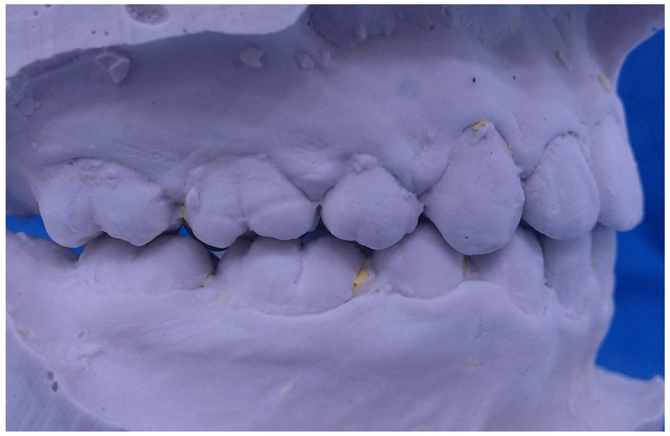


Cl.II

Reverse Curve of Spee



Curve of Spee



Andrews' Prescription

- Non orthodontic cases Norms
- Cl.I Treated orthodontic cases
- Cephalograms Cl.I, II, III
- Cl.II Treated orthodontic cases
- Cl.III Treated orthodontic cases

Andrews

Each tooth type is considered to be the same between individuals.

Germane

Any ideal pre-adjusted appliance featuring identical torques and angulations for all patients seems to be unrealistic.

Why sets of bracket important ?
(Andrew's System)

The focus point is the direction of the dental compensation based on malocclusion features (Cl. II, III), treatment goal and treatment prognosis.

The aim of Andrew's bracket prescription

Is to compensate torque and angulation at the anterior teeth to achieve an optimal occlusion, **despite the abnormal skeletal condition**

Sets of bracket prescriptions

Cl.I

normal maxillomandibular relationship

Cl.II

maxillomandibular discrepancies

Max > Mand

Cl.III

maxillomandibular discrepancies

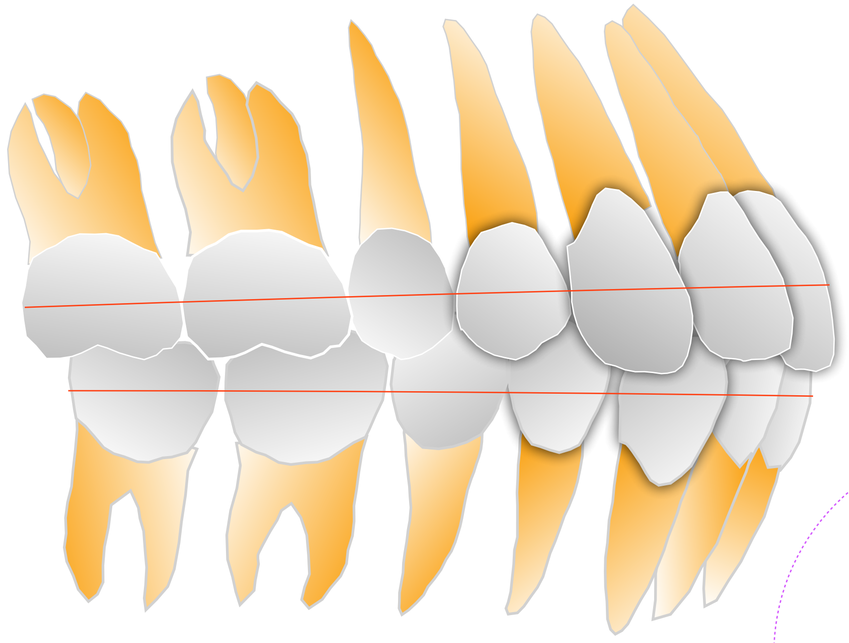
Mand > Max

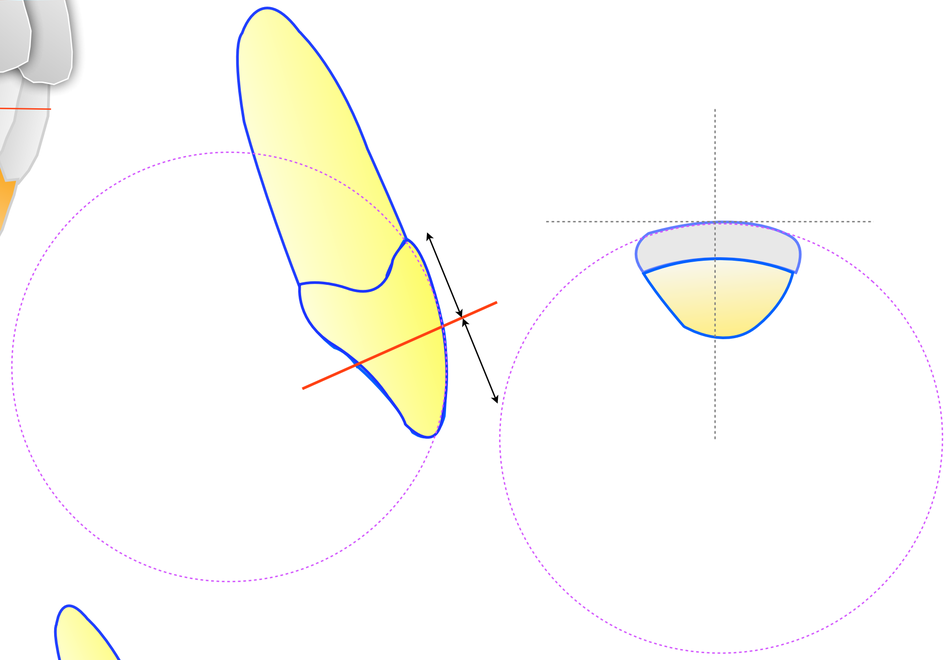
compensatory treatment not mechanic used

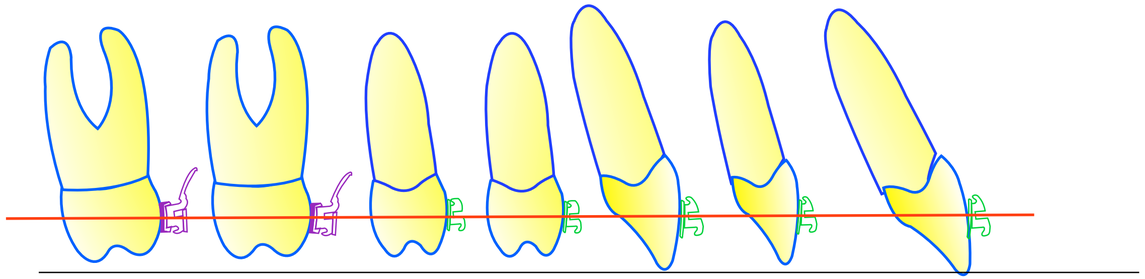
compensatory treatment not mechanic used

What did Andrew find ?

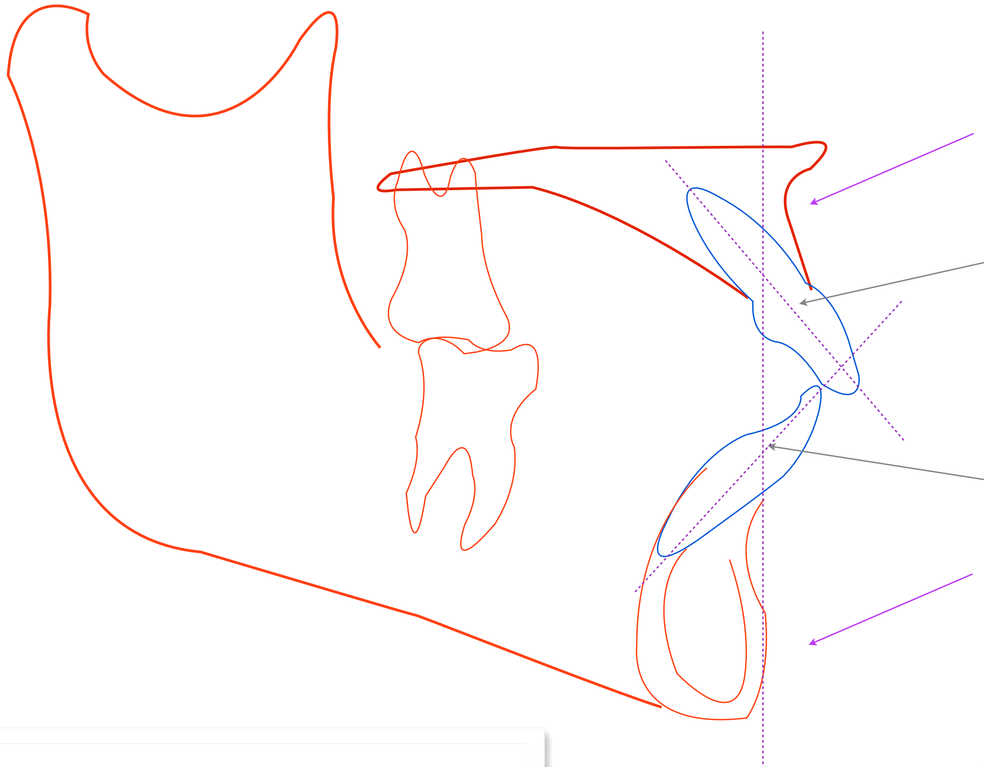
Andrew's Experiment







Cl. I bimaxillary protrusion corrected by compensatory tooth position (Dentally, no skeletal problems)



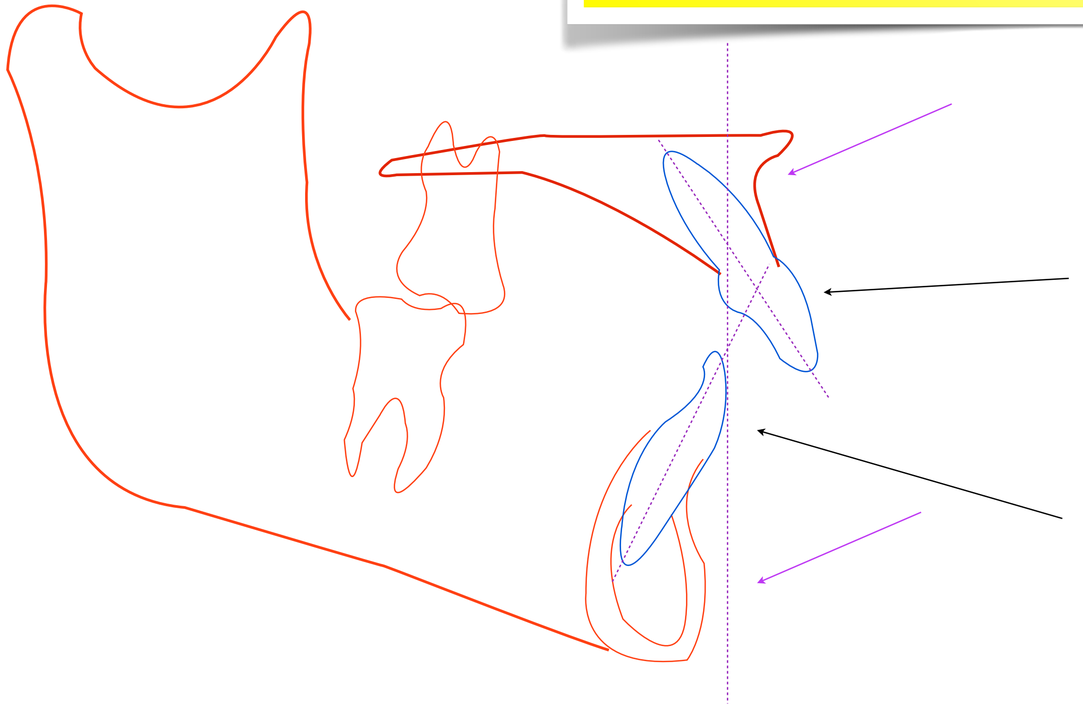
Retroclined 1/-

Retroclined -/1

Max : Forward position
Mand : Forward position
Dental : Proclined

Brackets prescription : Retroclined 1/1

Class II Corrected by compensatory tooth position



Retroclined 1/-

Proclined -/1

Max : Forward position
Mand : Normal
Dental : Proclined / Retroclined

Brackets prescription : Retroclined 1/-
Proclined -/1

Class II Correction by compensatory tooth position

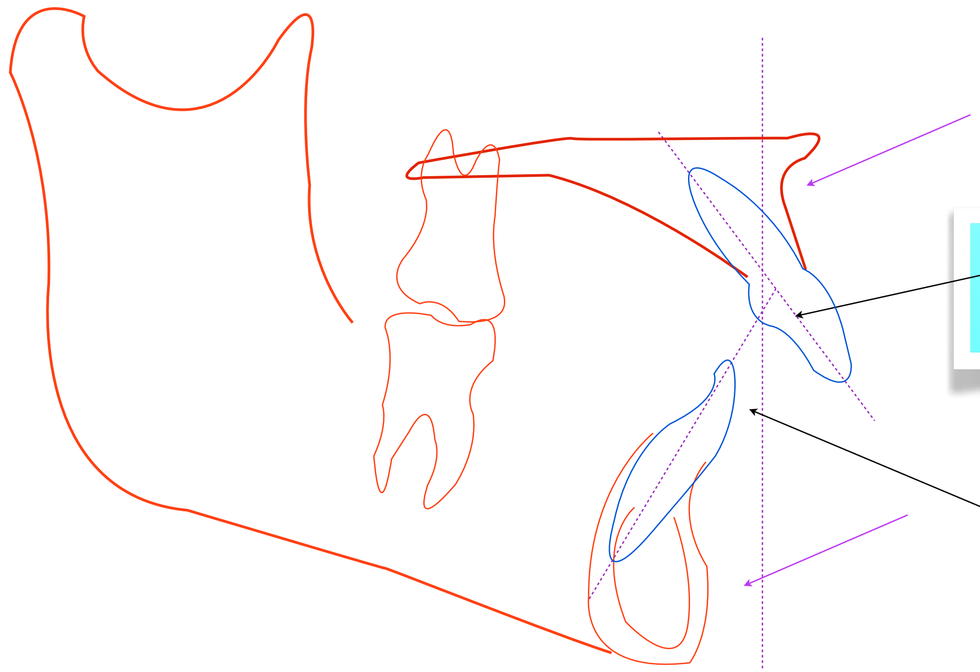
Retroclined 1/-

Proclined -/1

Max: Normal
Mand : Backward Position
Dental : Proclined / Retroclined

Brackets prescription : Retroclined 1/-
Proclined -/1

Class II Correction by compensatory tooth position



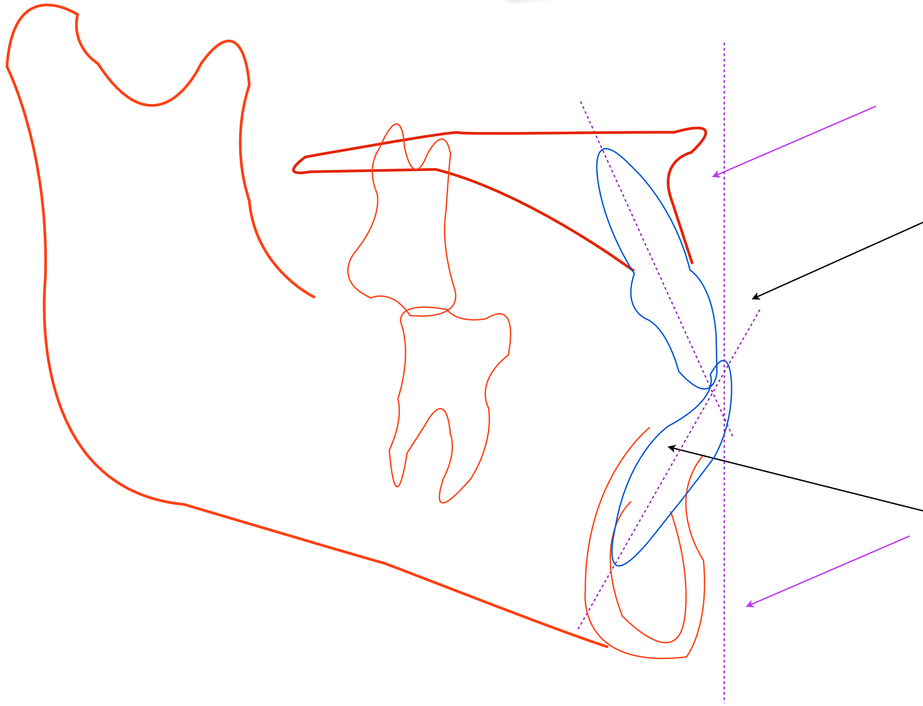
Retroclined 1/- (more)

Proclined -/1 (more)

Combination of Both : Within the range of compensatory orthodontic treatment

Brackets prescription : Retroclined 1/-
Proclined -/1

Class III Correction by compensatory tooth position



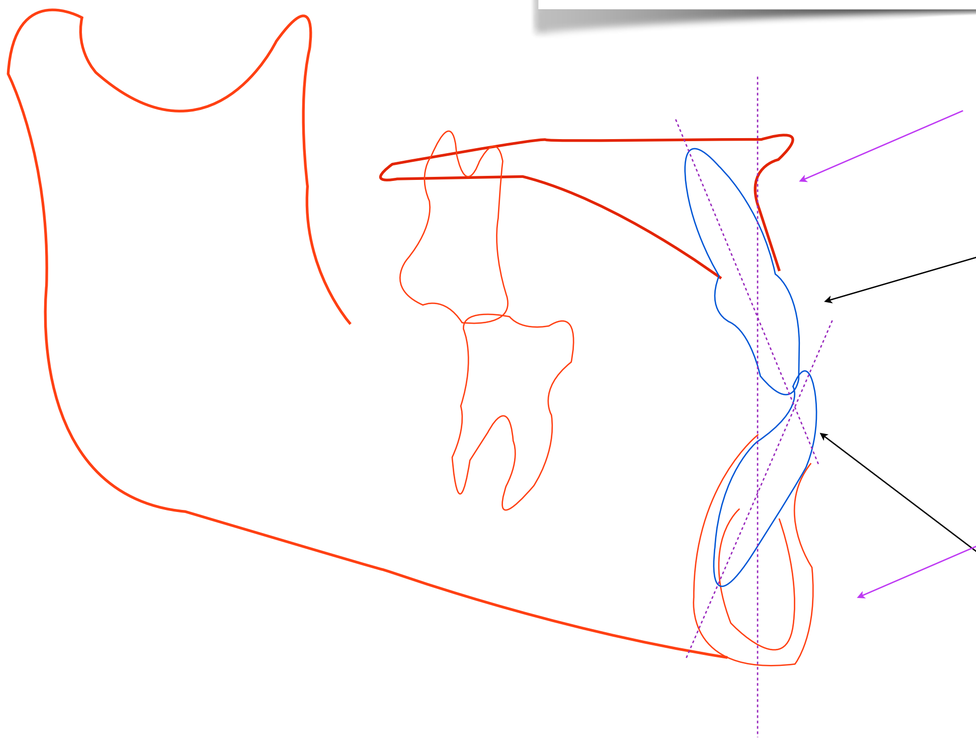
Proclined I/-

Retroclined - / I

Max : Backward position
Mand : Normal
Dental : Proclined / Retroclined

Brackets prescription : Proclined 1/-
Retroclined -/1

Class III Correction by compensatory tooth position



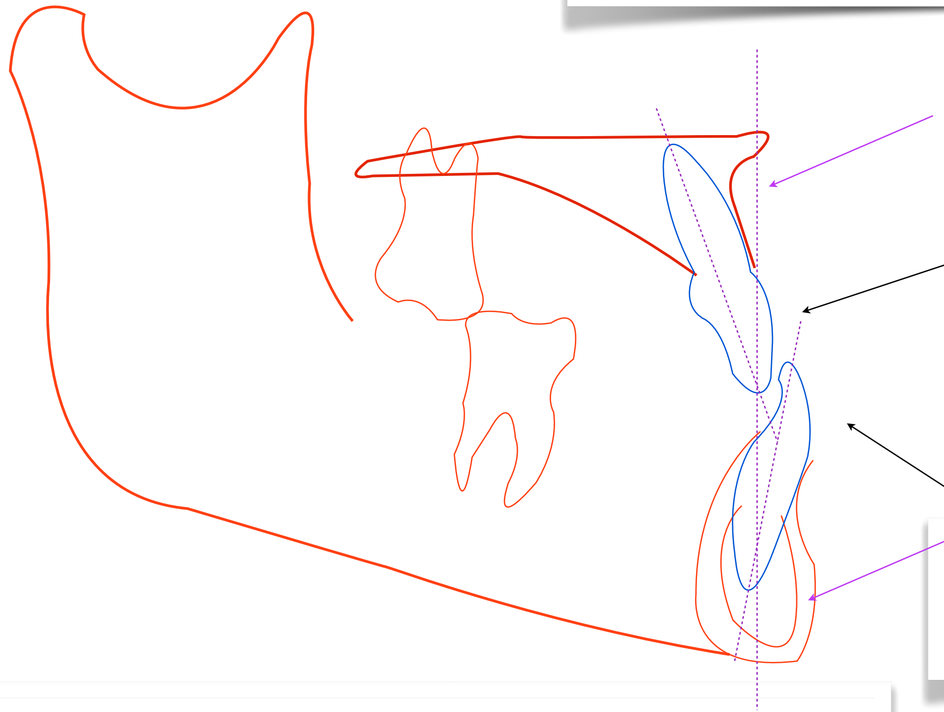
Proclined I/-

Retroclined - / I

Max: Normal
Mand : Forward Position
Dental : Proclined / Retroclined

Brackets prescription : Proclined 1/-
Retroclined -/1

Class III Correction by compensatory tooth position



Proclined 1/- (more)

Retroclined - / 1(more)

Combination of Both : Within the range of compensatory orthodontic treatment

Brackets prescription : Proclined 1/-
Retroclined -/1

Andrews' Prescription

Non orthodontic cases Norms

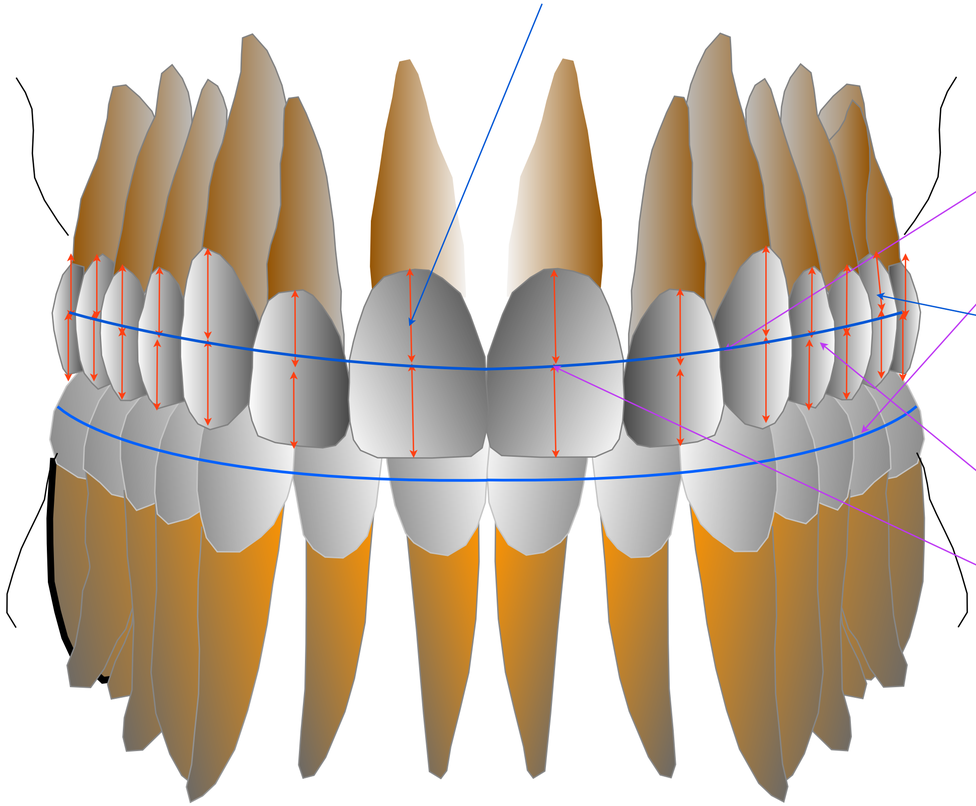
Cl.I Treated orthodontic cases

Andrew built up his prescription from normal occlusion and treated malocclusion (Cl.II, Cl.III), not from mechanic used point of view.

Cl.II Treated orthodontic cases

Cl.III Treated orthodontic cases

Middle developmental groove



Andrew Plane

Buccal groove

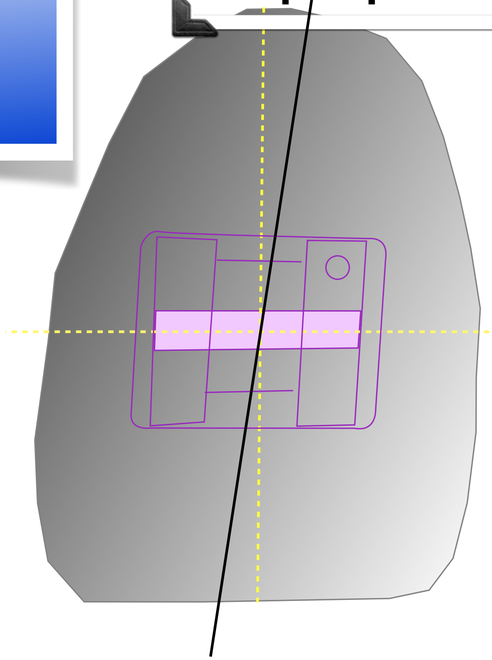
FA Point

Facial Axis

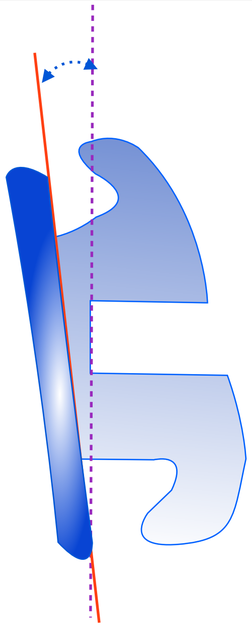
Andrews' Reference line & Point

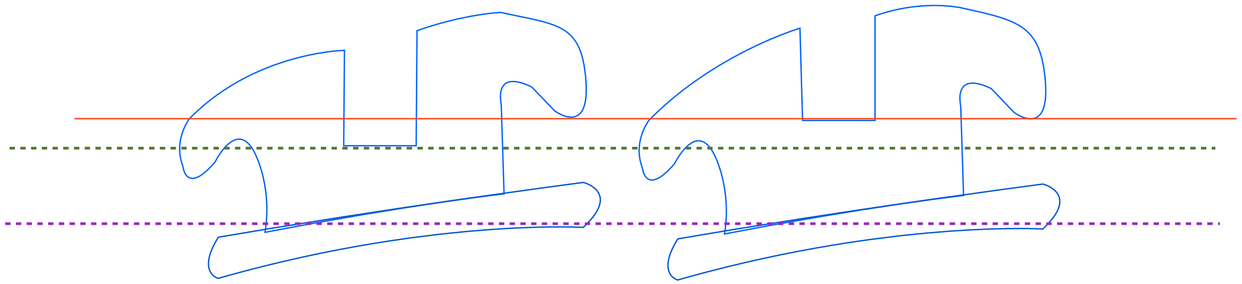
Bracket Specification

Tip Specification



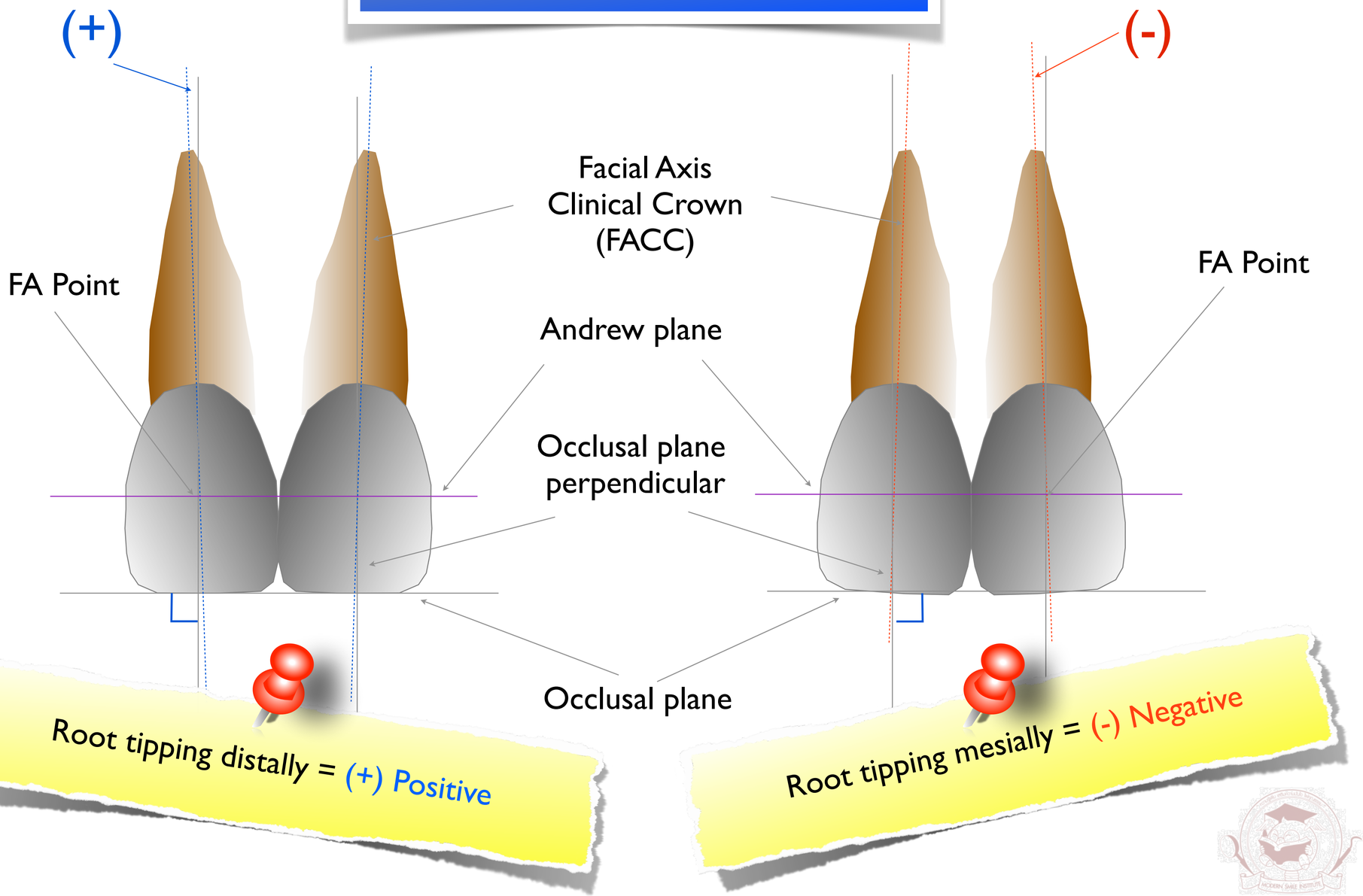
Torque Specification



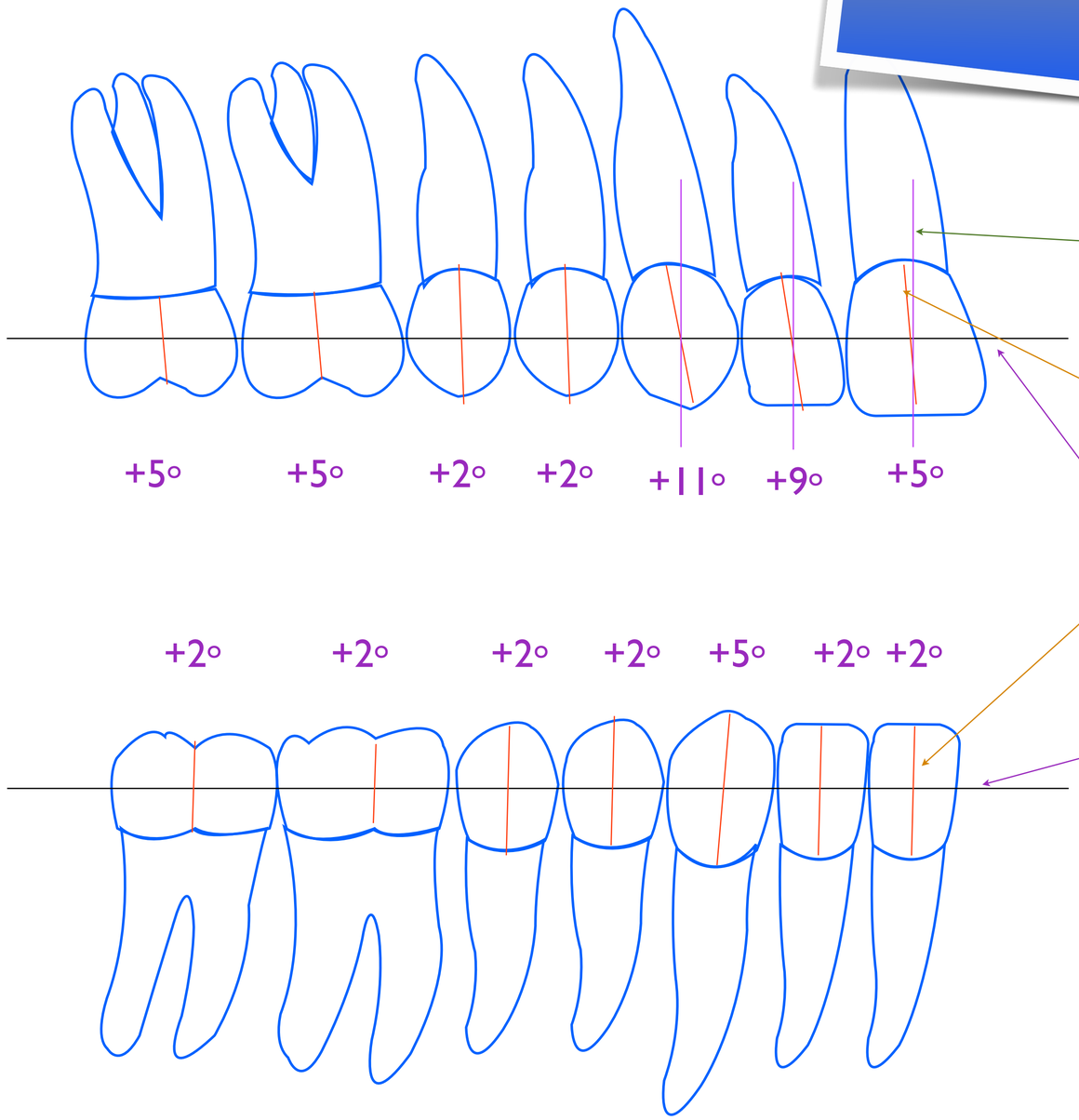


In-Out Specification

Crown Angulation (Tip)



Andrew's Tip Specification (Angulation)



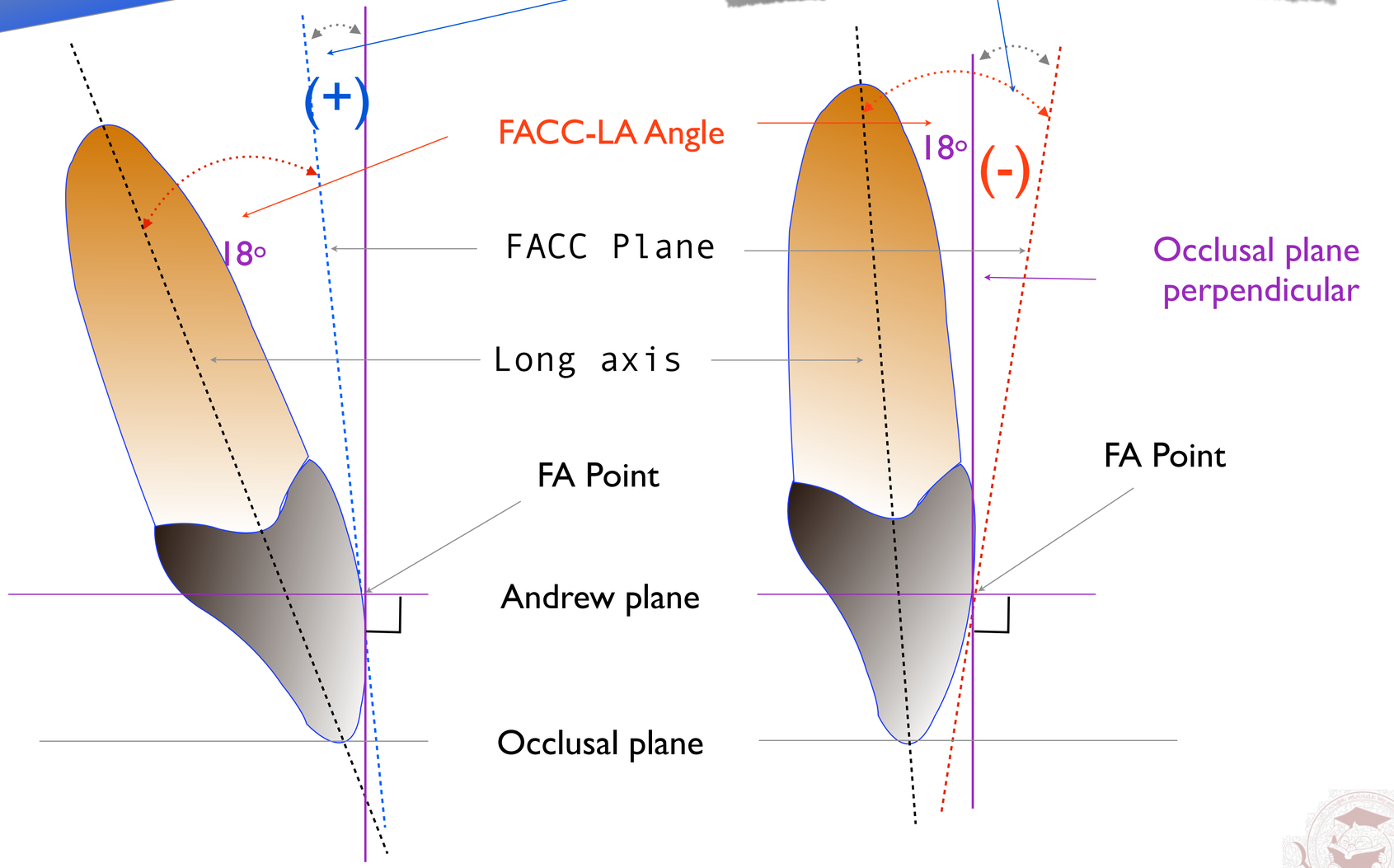
Occlusal plane perpendicular

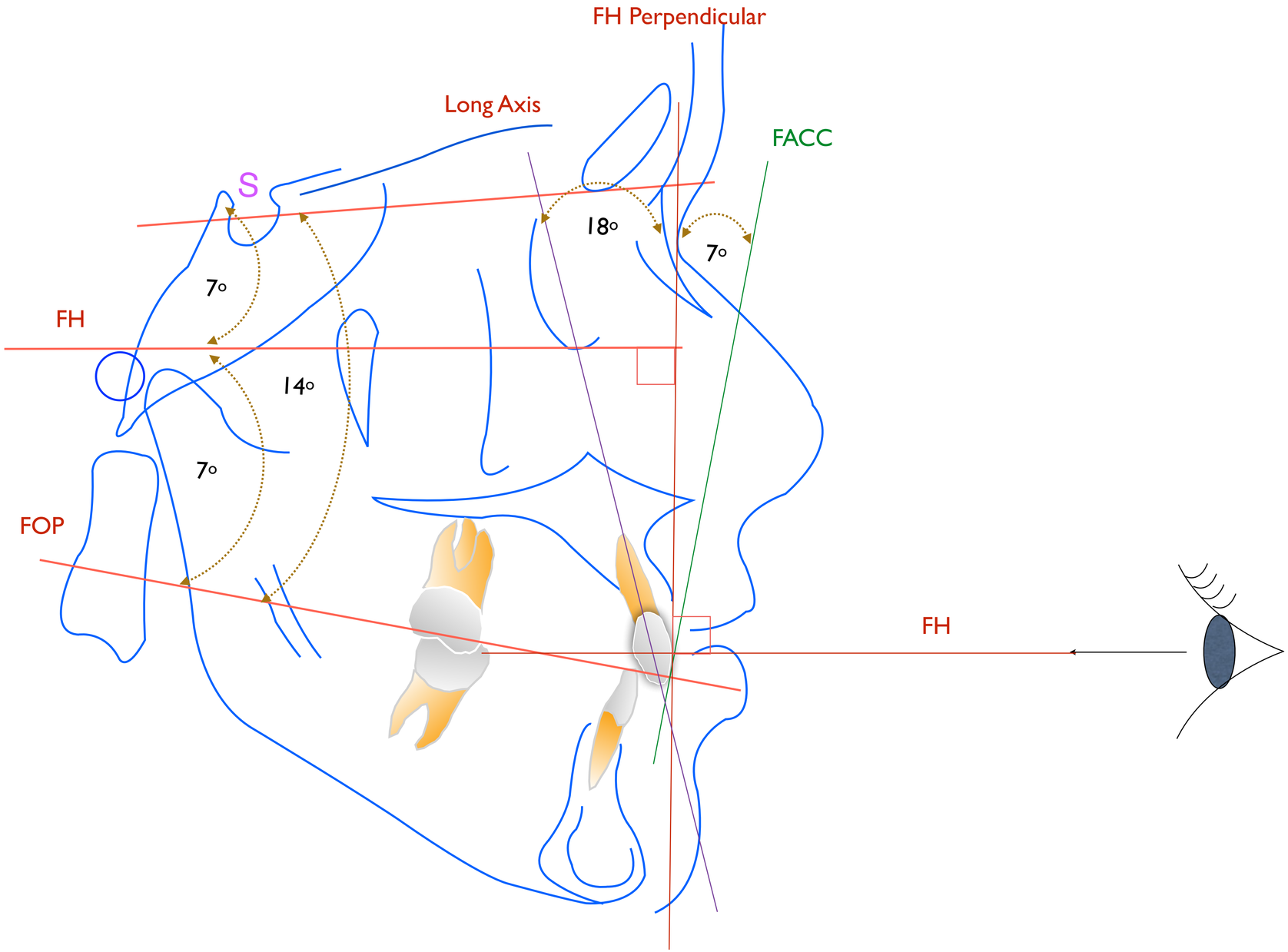
Facial Axis Clinical Crown (FACC)

Andrew plane

Crown Inclination (Torque)

FACC plane - Occlusal plane perpendicular Angle (Torque)

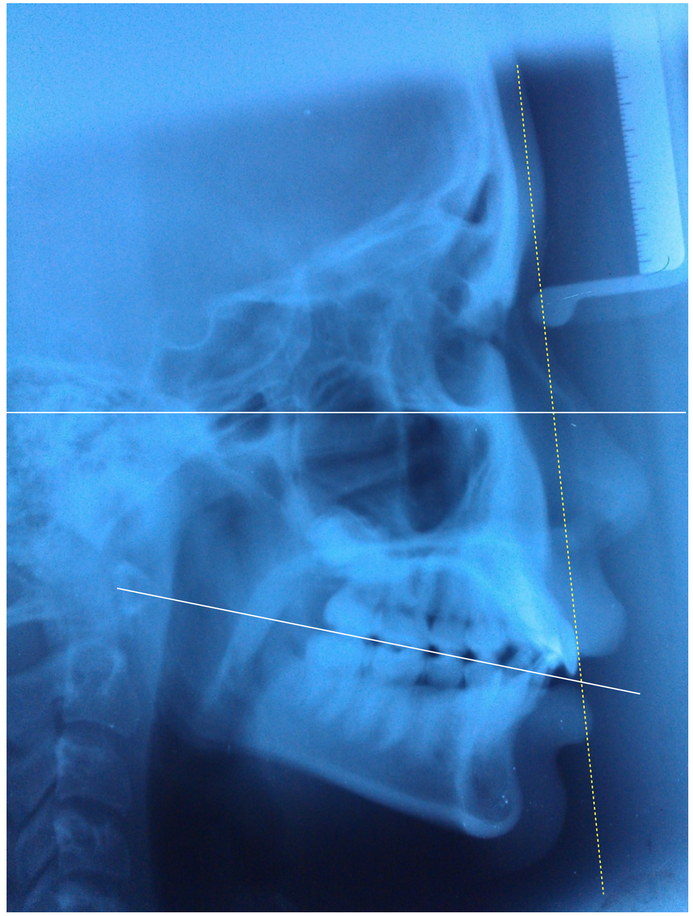


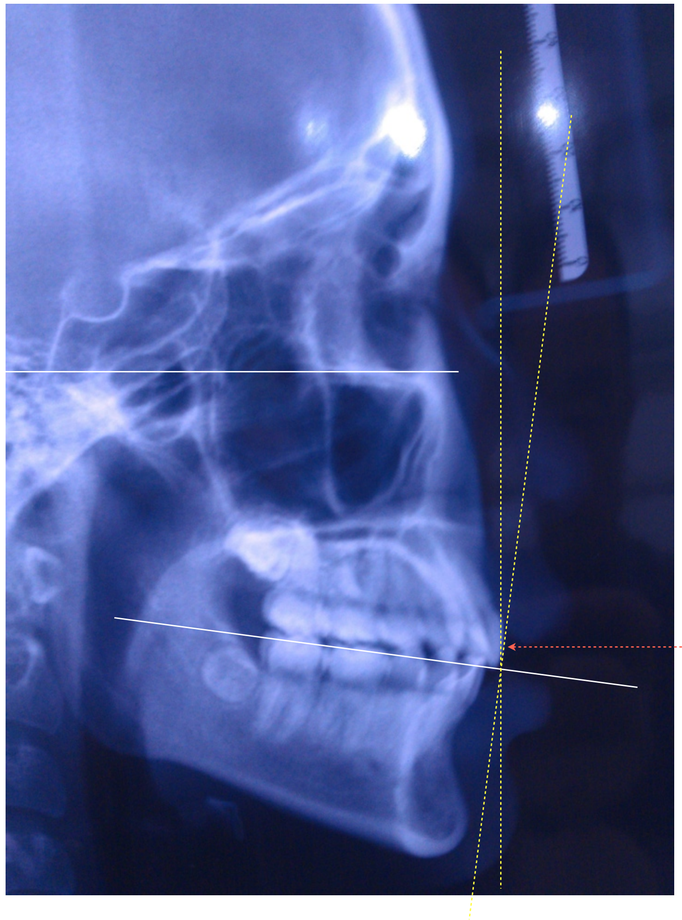

FH Perpendicular
Long Axis
FACC
S
18°
7°
7°
FH
14°
7°
FOP
FH

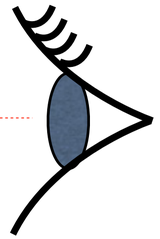
Andrews' Prescription

Max tooth	Optimal Torque	Average Torque	Range	Standard Deviation
Central	+7	+6.1	-7 to +15	+/- 4.0
Lateral	+3	+4.4	-6 to +17	+/- 4.4
Canine	-7	-7.3	-17 to +10	+/- 4.2
1st Premolar	-7	-8.5	-20 to +5	+/-4.0
2nd Molar	-7	-8.8	-20 to +3	+/- 4.1
1st Molar	-9	-11.5	-25 to +2	+/- 3.9
2nd Molar	-9	-8.1	-25 to +12	+/- 5.6

Mand tooth	Optimal Torque	Average Torque	Range	Standard Deviation
Central	-1	-1.7	-17 to +16	+/-5.8
Lateral	-1	-3.2	-19 to +15	+/-5.4
Canine	-11	-12.7	-26 to +2	+/-4.7
1st Premolar	-17	-19	-35 to -1	+/-5.0
2nd Molar	-22	-23.6	-45 to -8	+/-5.6
1st Molar	-30	-30.7	-55 to -9	+/-5.9
2nd Molar	-35	-36	-60 to -9	+/-6.6

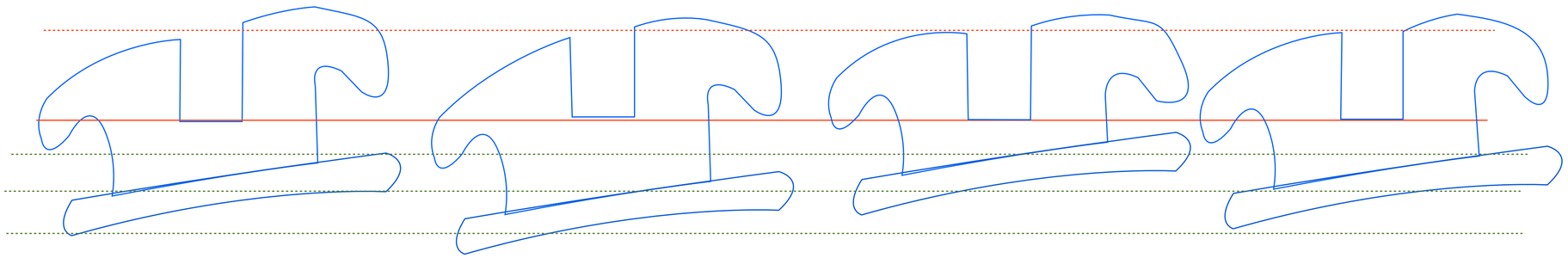






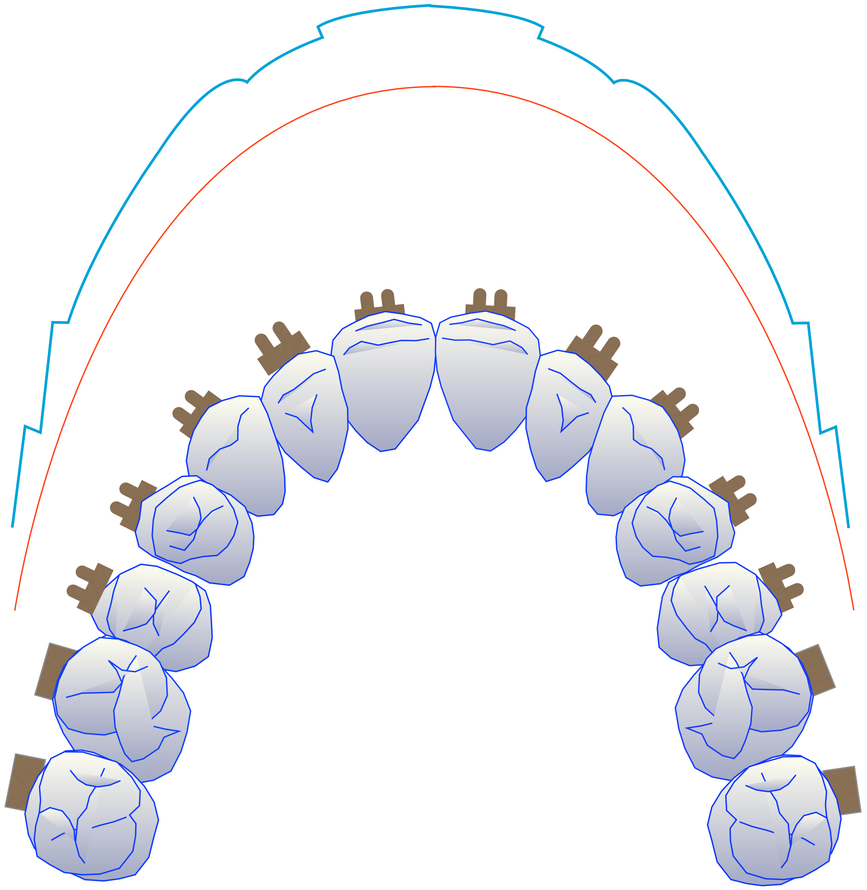
In-Out Specification

1/-	2/-	3/-	4,5/-



1.8mm	2.25mm	1.4mm	1.5mm

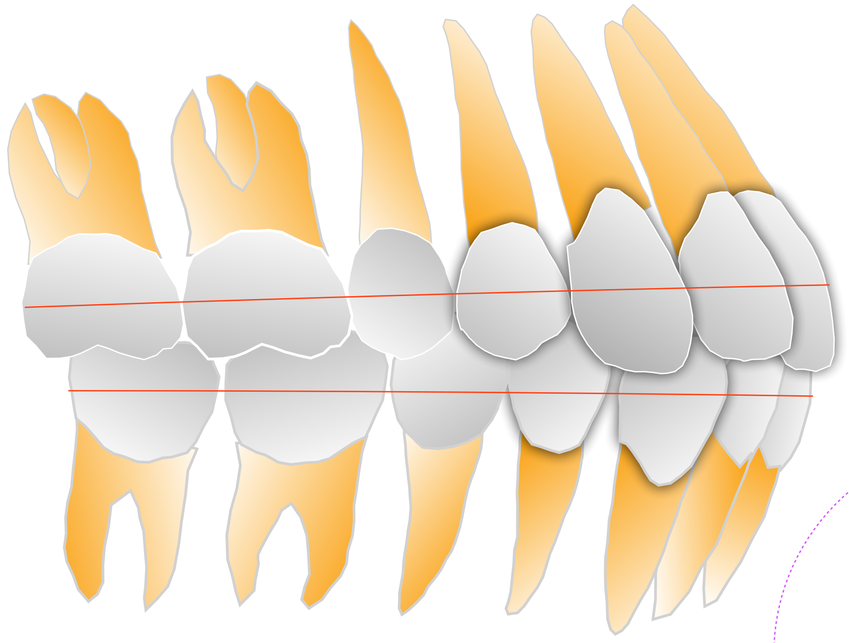
In-Out Offset

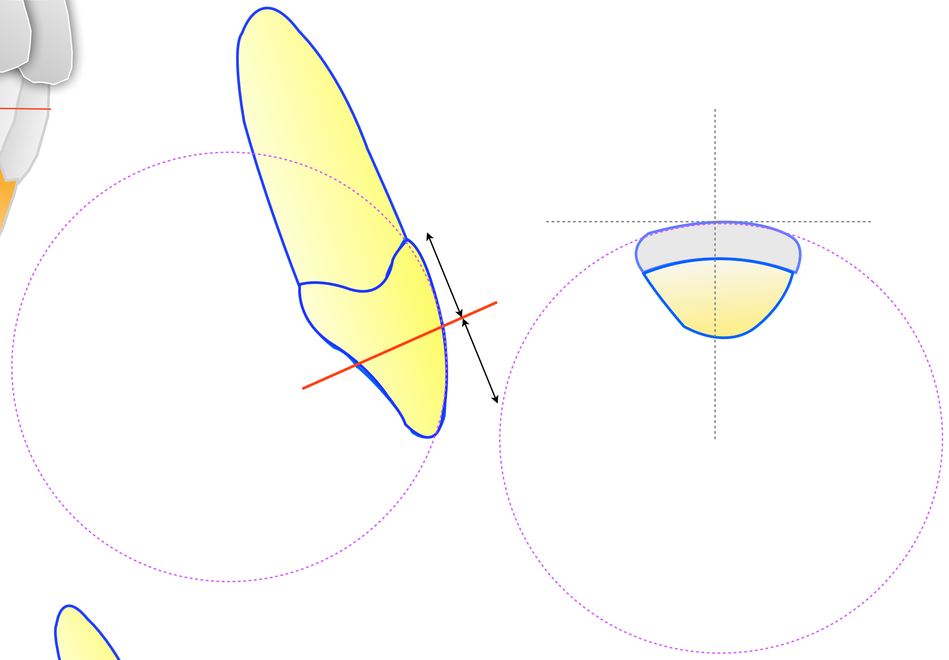


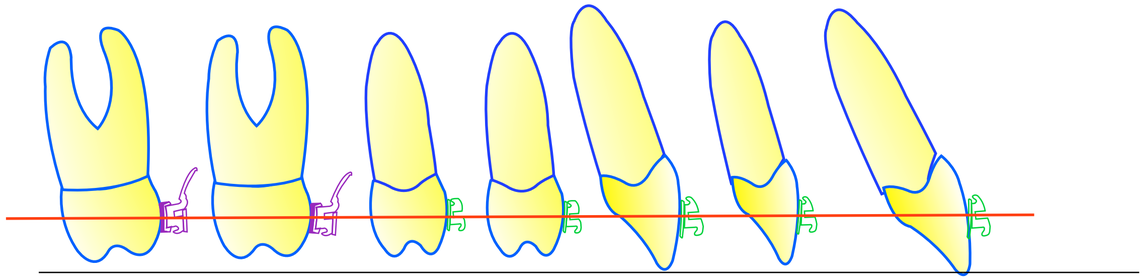
	1	2	3	4	5	6	7
Upper	1.8	2.25	1.4	1.5	1.5	1	1
Lower	2.3	2.3	1.6	1.15	1.15	1	1

Bracket Manufacturing for Andrews' Prescription

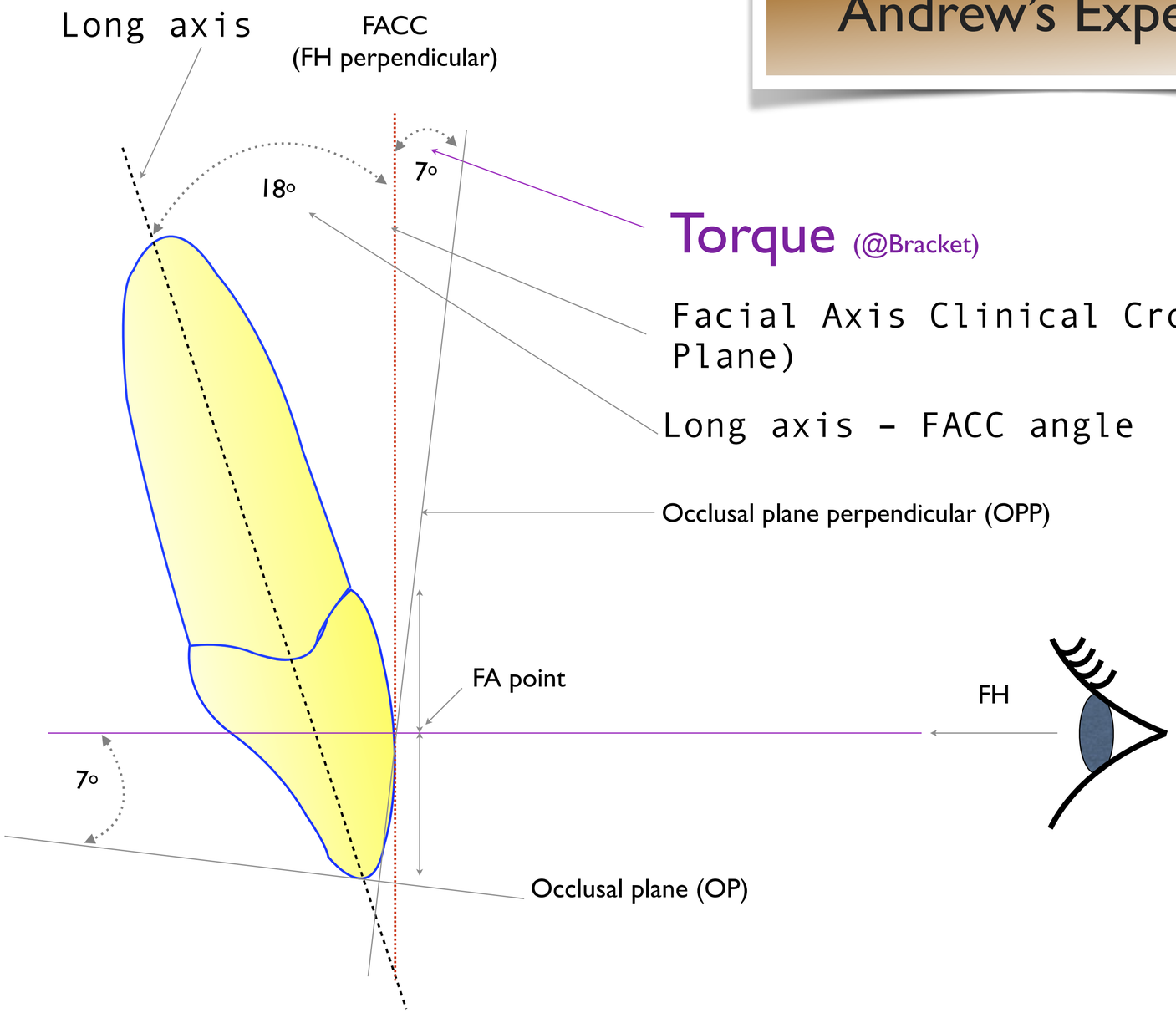
Andrew's Experiment







Andrew's Experiment



Torque (@Bracket)

Facial Axis Clinical Crown (FACC Plane)

Long axis – FACC angle

Upper central Incisors

an average difference of 18° between the inclination of the facial axis (FACC) of the crown and that of the long axis of the tooth

Torque

Cl.I : +7°
Cl.II : +2°
Cl.III : +12°

Tip

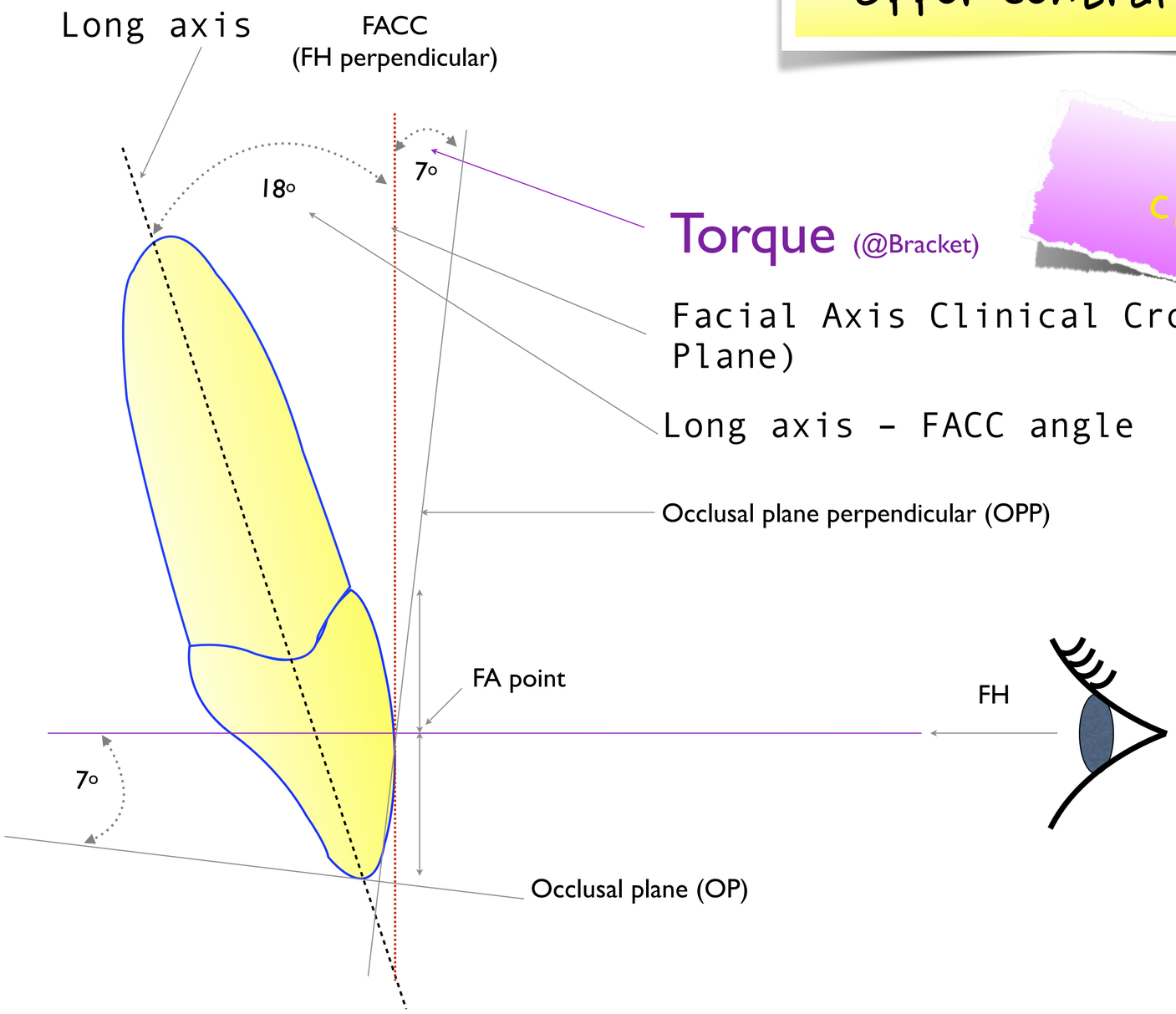
5°

In-out

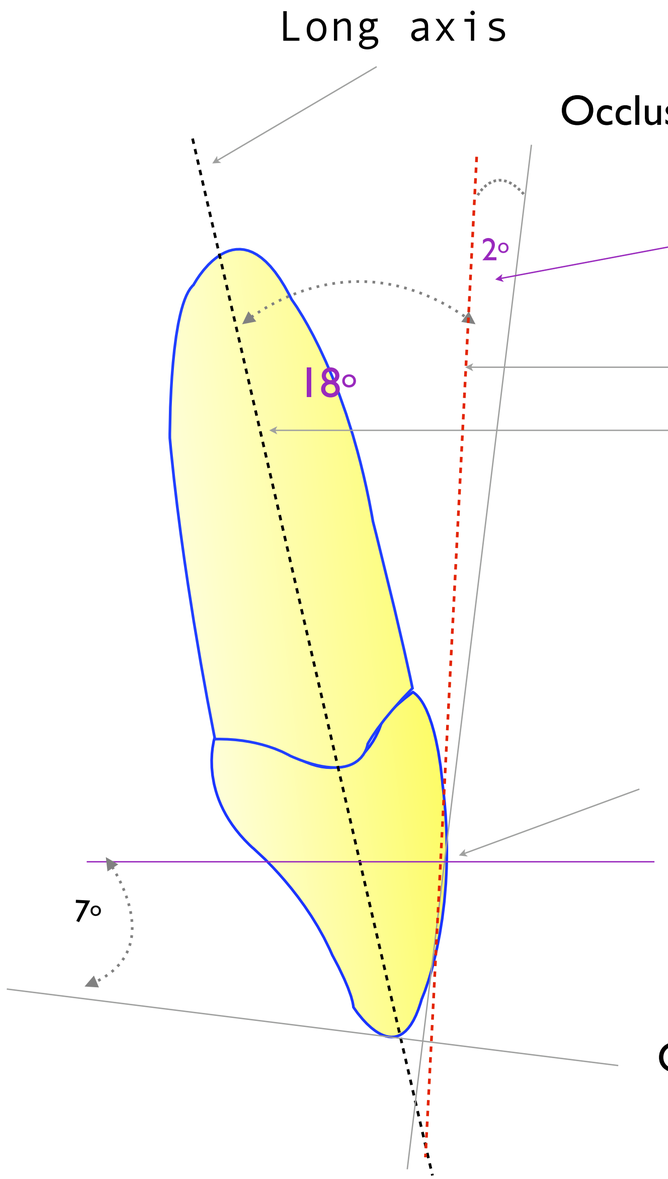
1.8 mm.

upper central Incisors

class.1



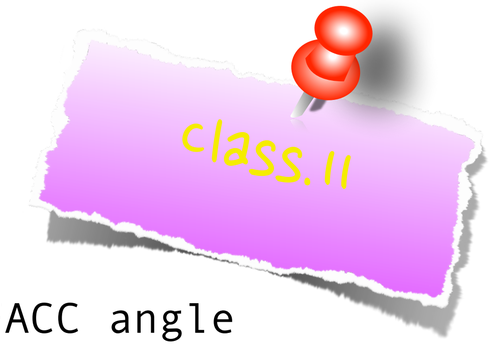
upper central Incisors

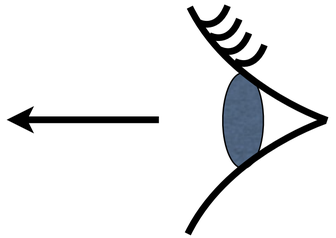


Torque

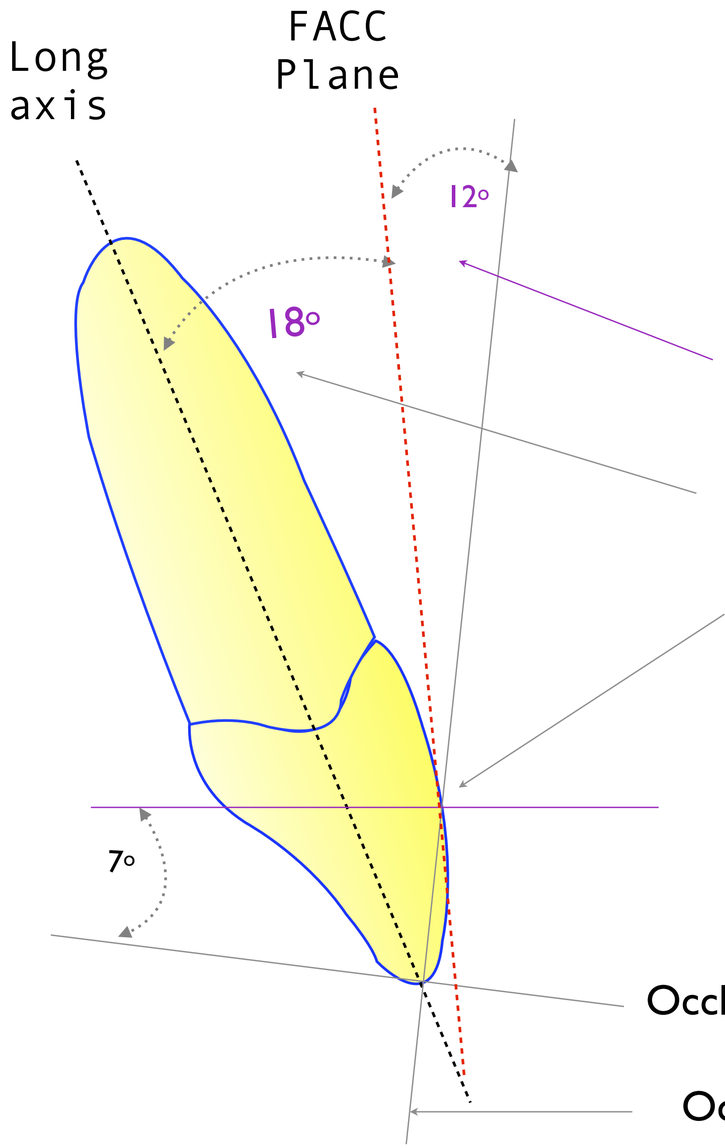
FACC Plane

Long axis - FACC angle





Upper central Incisors

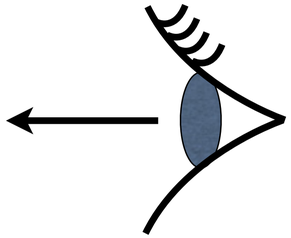


Class. III

Torque

Long axis – FACC angle

FA point

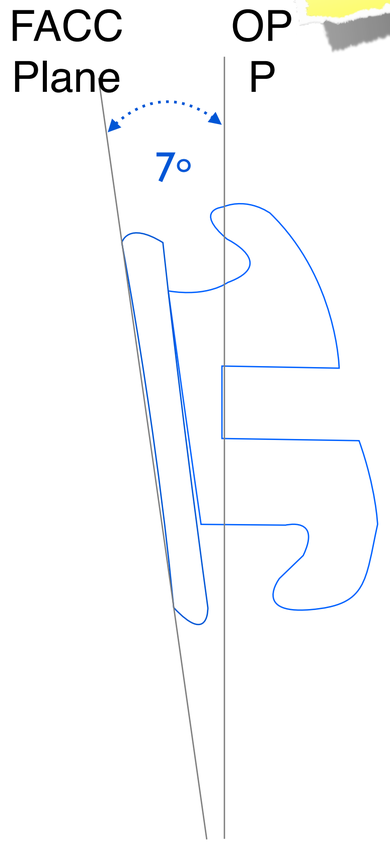


Occlusal plane

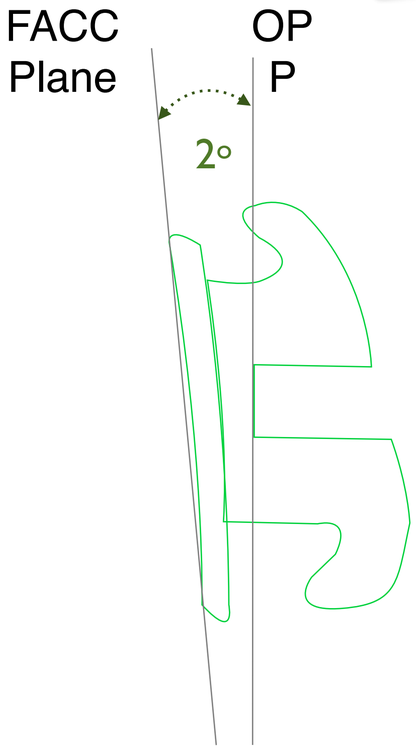
Occlusal plane perpendicular

Bracket manufacturing & Torque Prescription

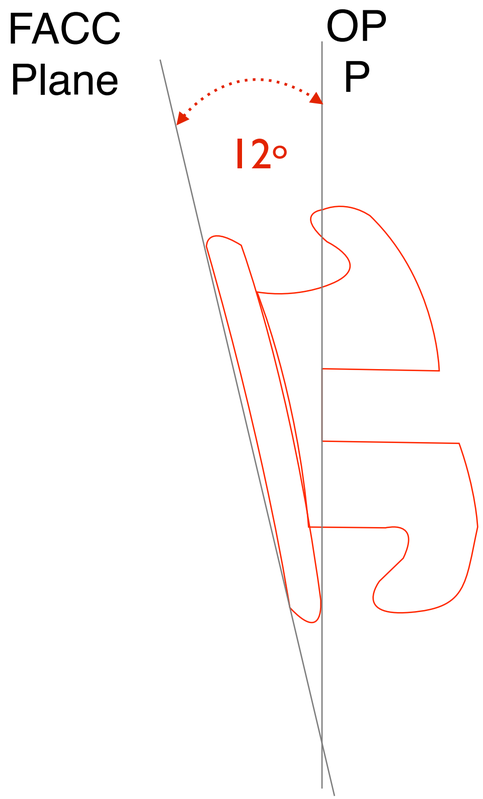
upper central incisors



Cl.I

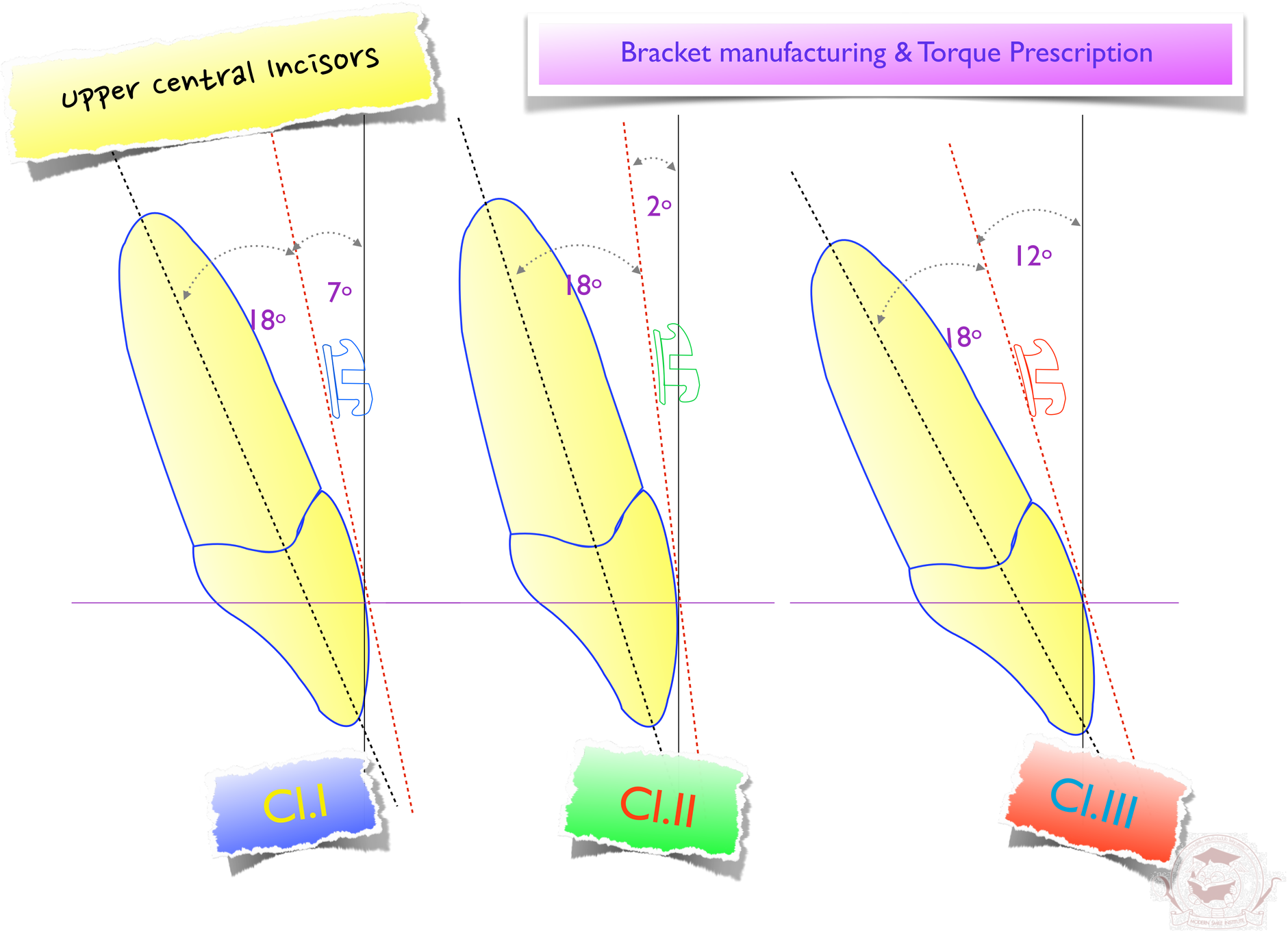


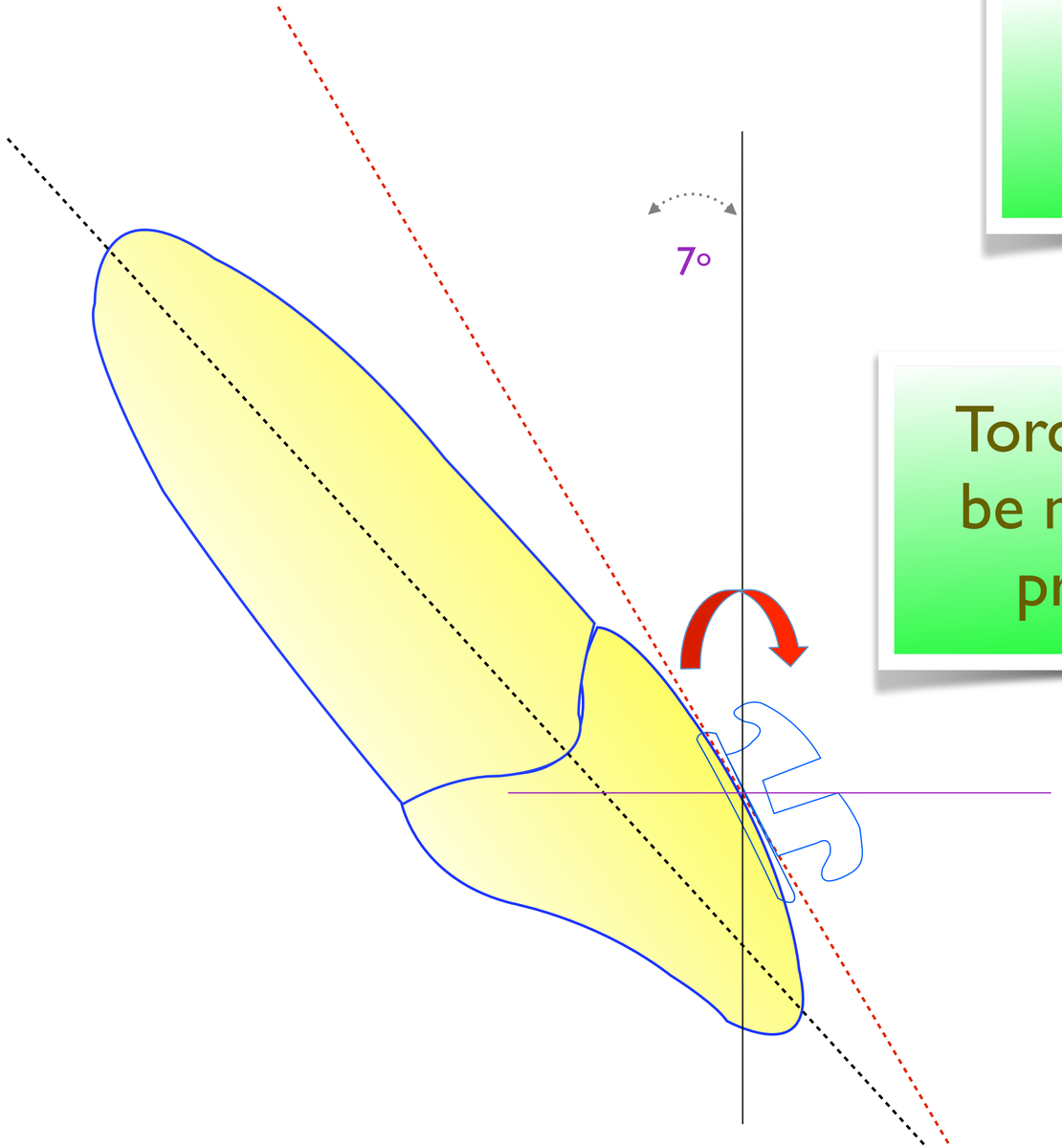
Cl.II



Cl.III

Bracket manufacturing & Torque Prescription

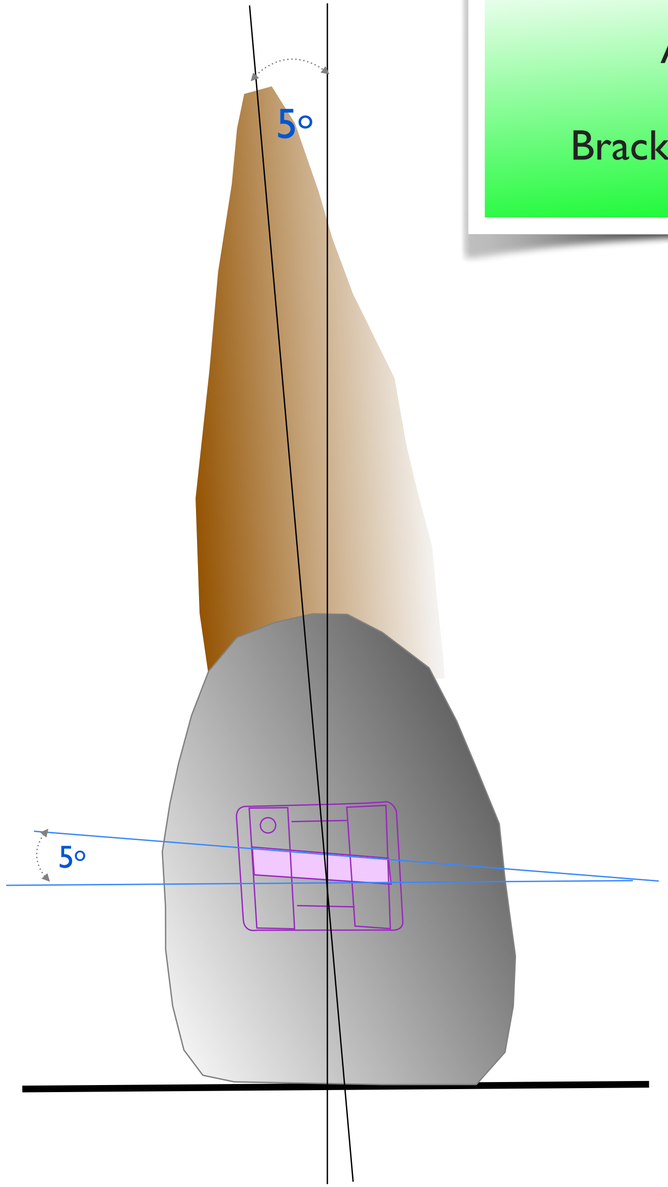


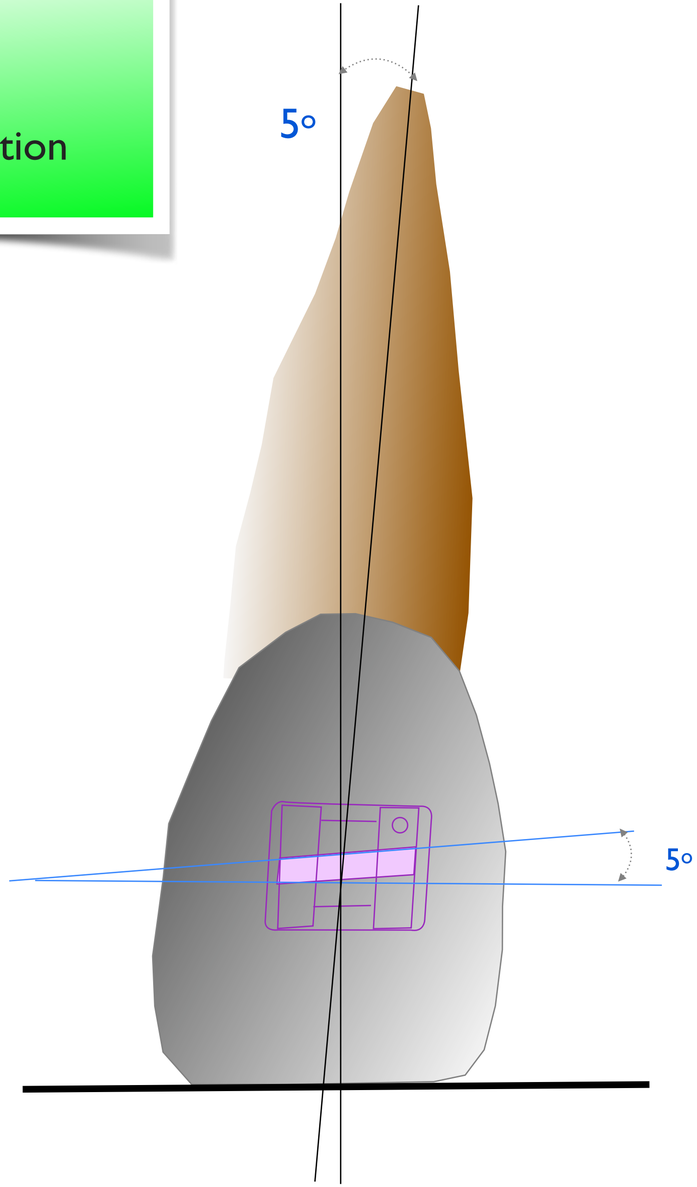


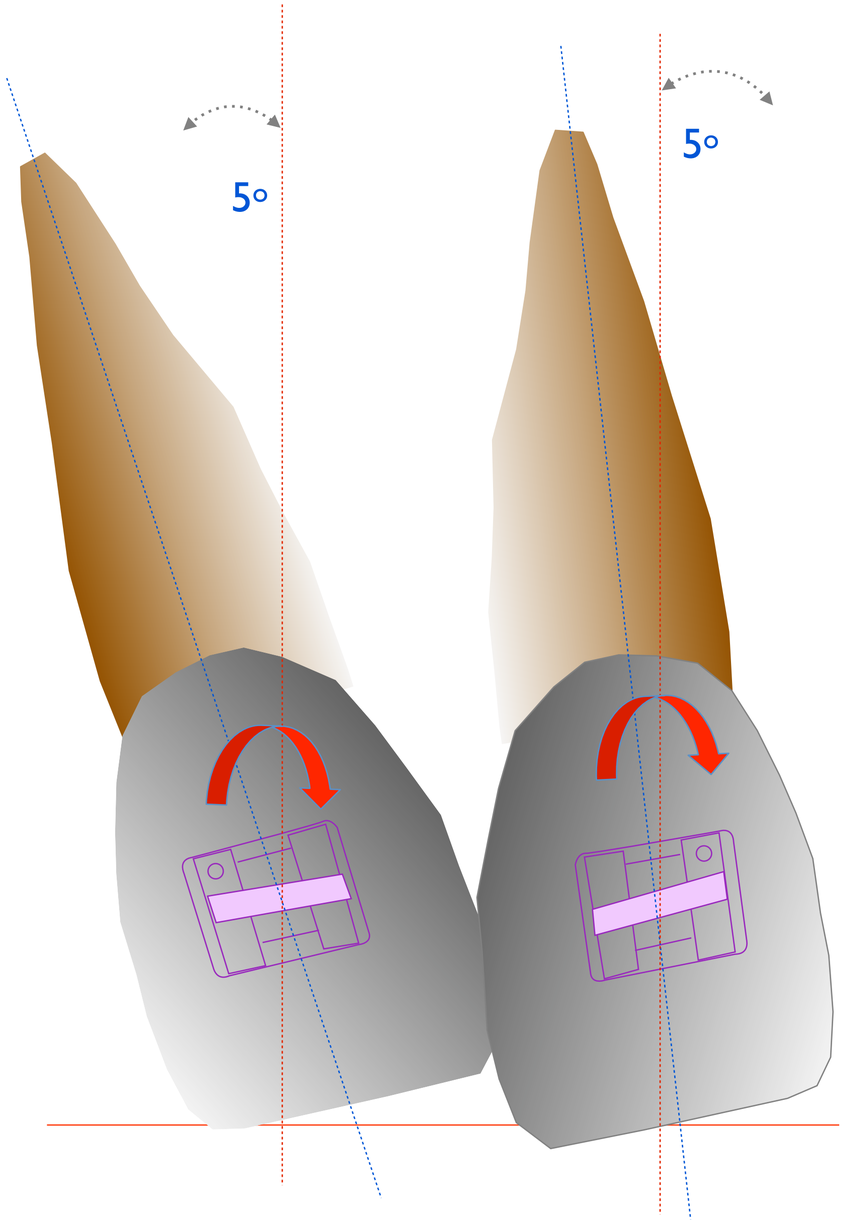
How pre-adjusted bracket works ?

Torque of the teeth will be mandated by bracket prescription chosen

Angulation & Bracket Prescription







Angulation
&
Bracket Prescription

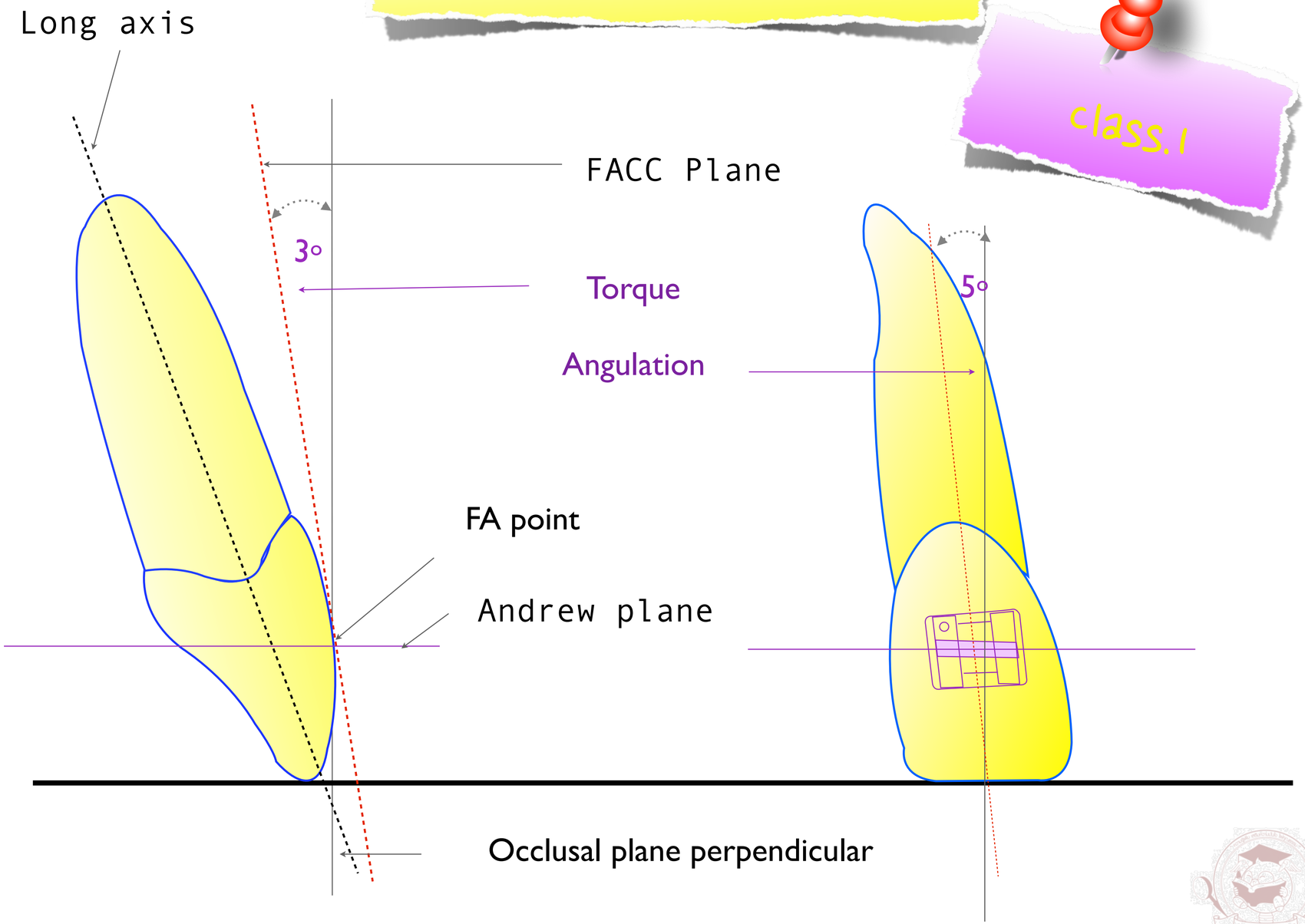
Upper Lateral Incisors

Torque value is 4^0 less than torque of upper central incisors

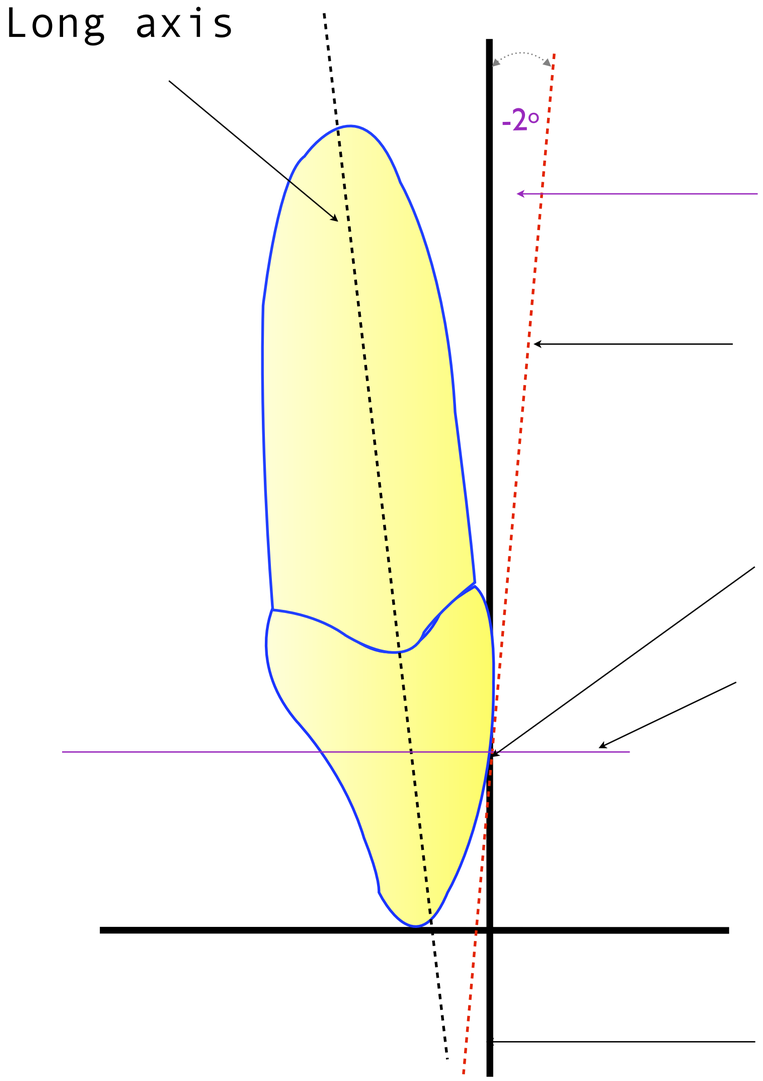
Torque	Tip	In-out
Cl.I :+3 (7-4) Cl.II : = -2 (2-4) Cl.III := +8 (12-4)	5^o	2.25 mm.

Upper Lateral Incisors

class.1



Upper Lateral Incisors



Torque

FACC Plane

FA point

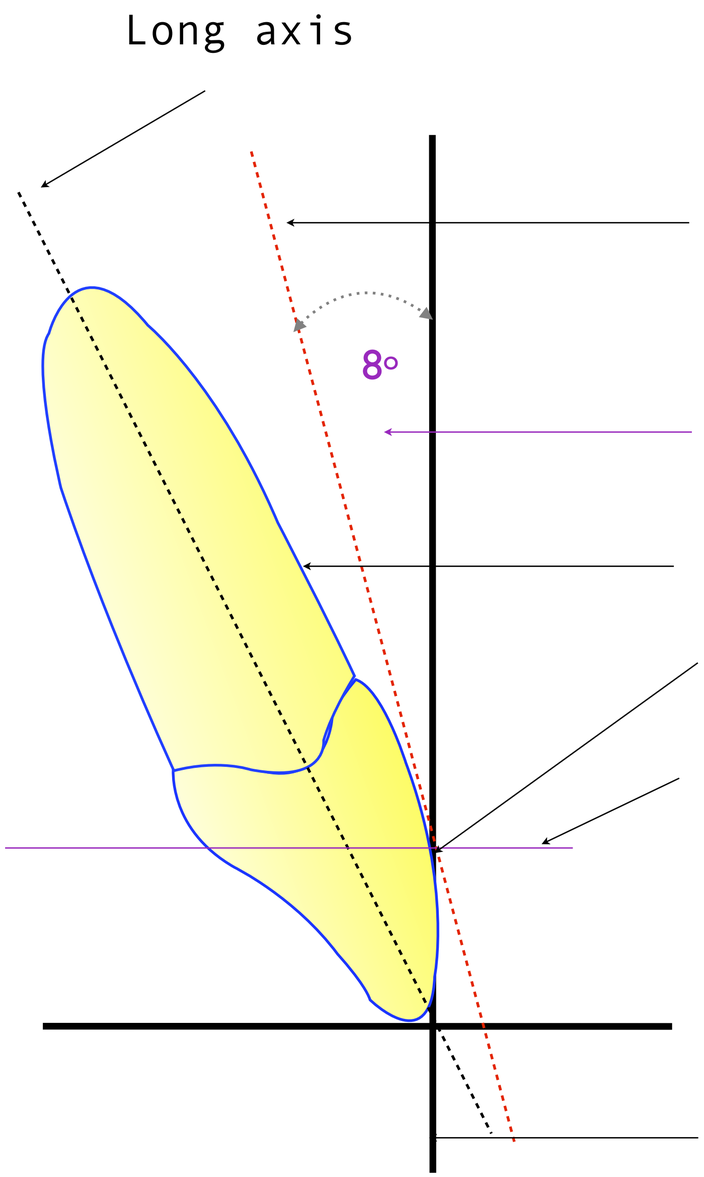
Andrew plane

Occlusal plane

Occlusal plane perpendicular

class. II

Upper Lateral Incisors



FACC Plane

Torque

Long axis – FACC angle

FA point

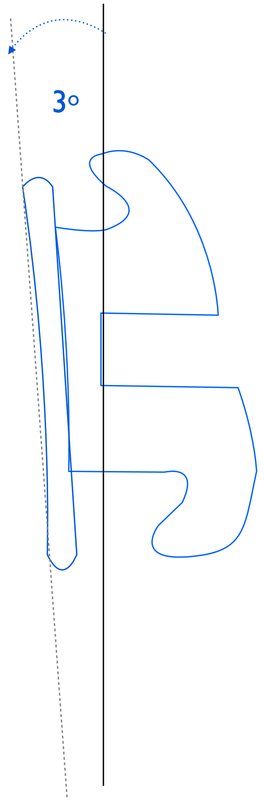
Andrew plane

Occlusal plane

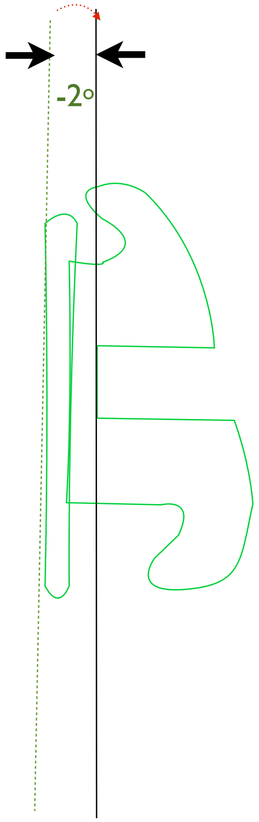
Occlusal plane perpendicular

Upper Lateral Incisors

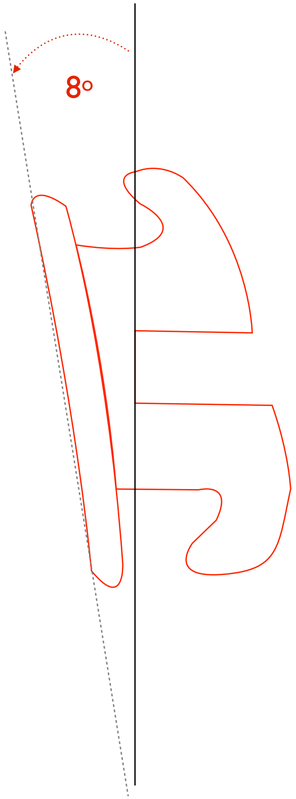
Bracket manufacturing & Torque Prescription



Cl.I

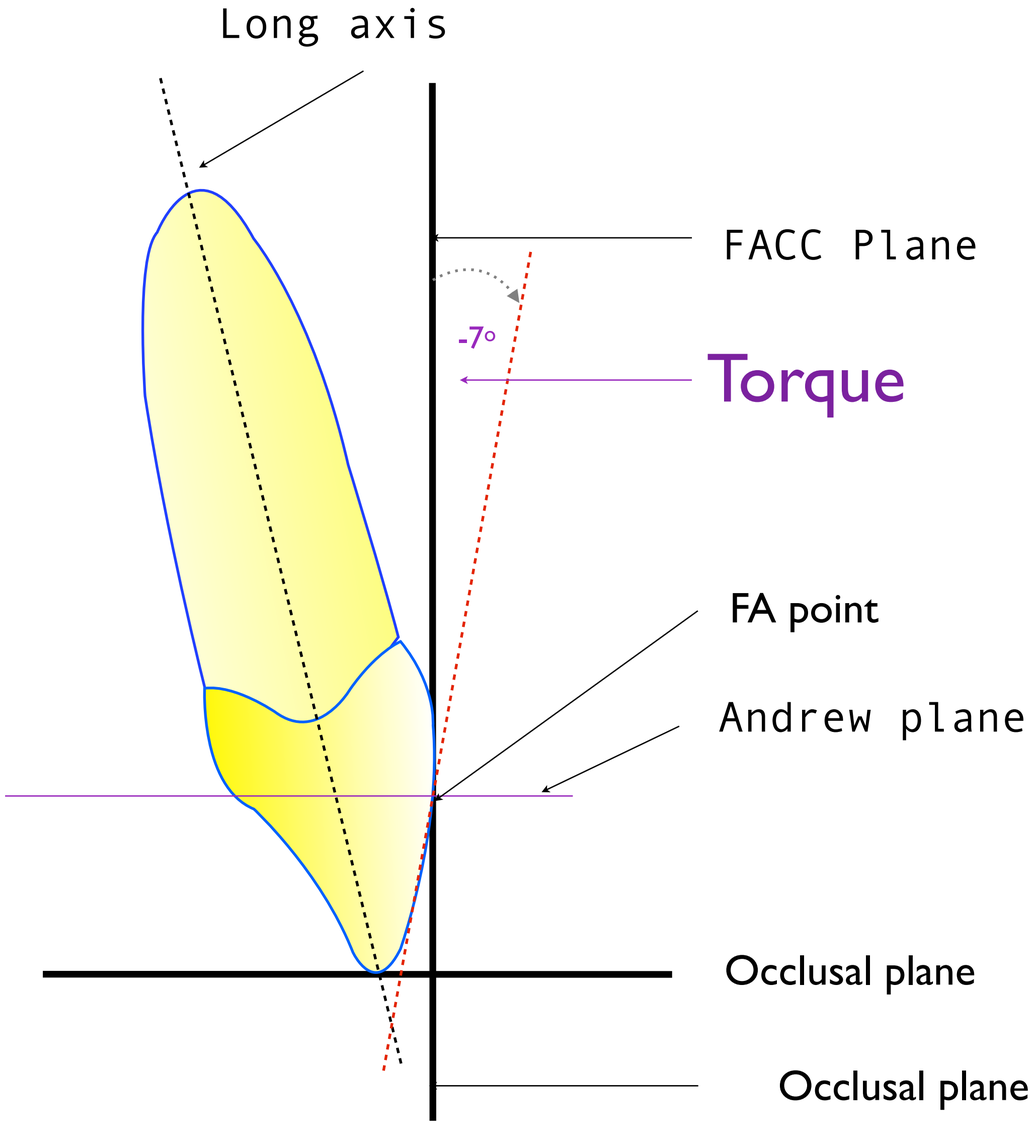


Cl.II



Cl.III

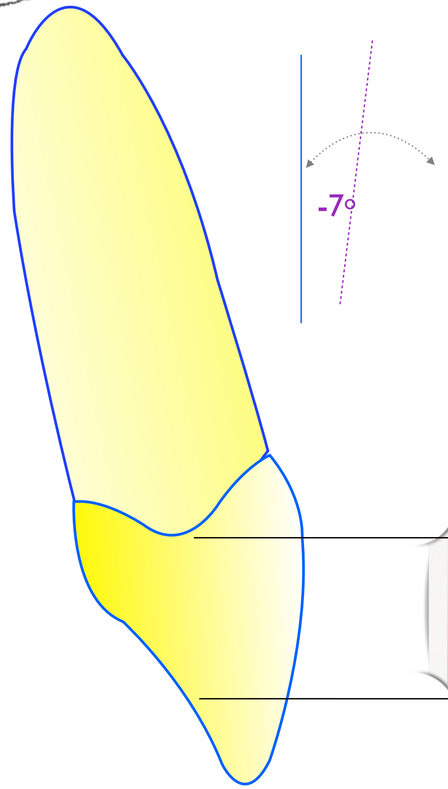
Upper canine



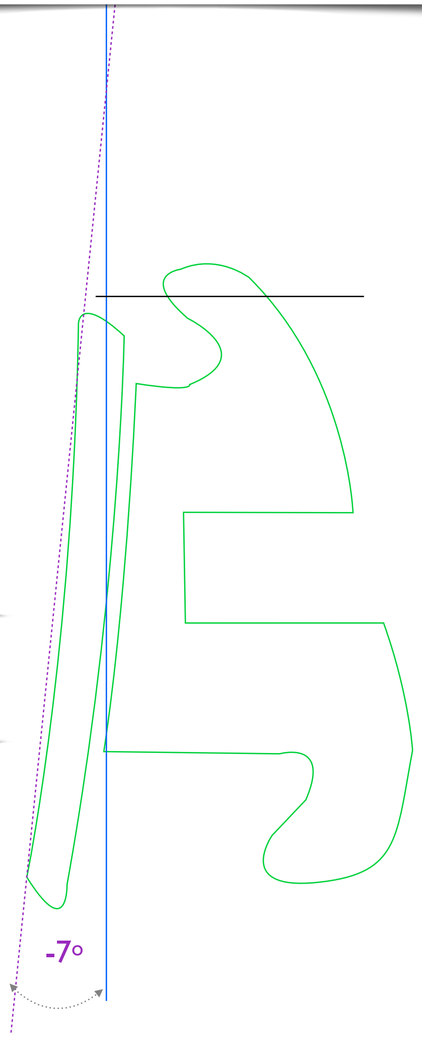
Torque = -7°
Tip = +11°
In-out =1.4 mm

Bracket manufacturing & Torque Prescription

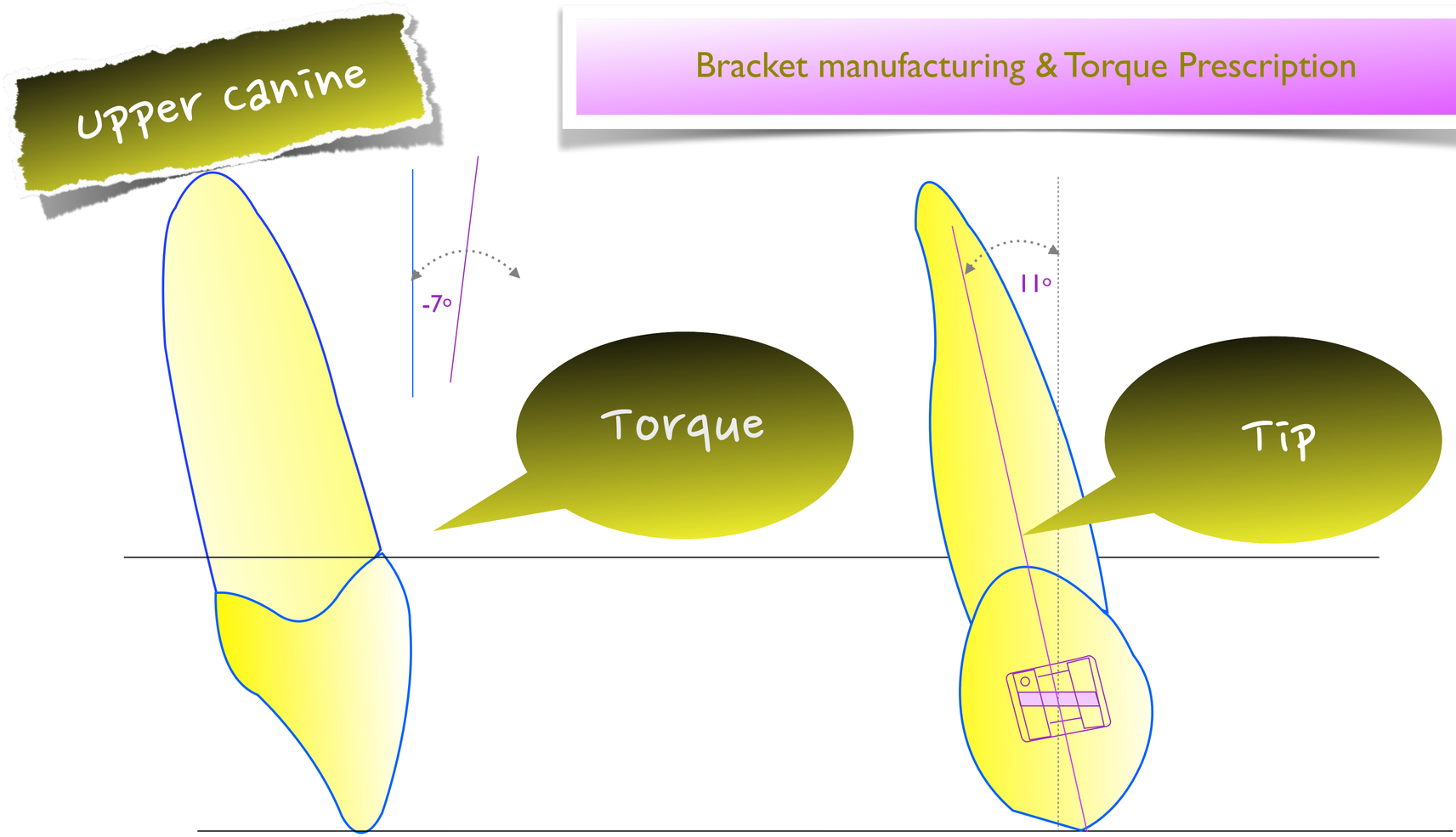
upper canine Torque



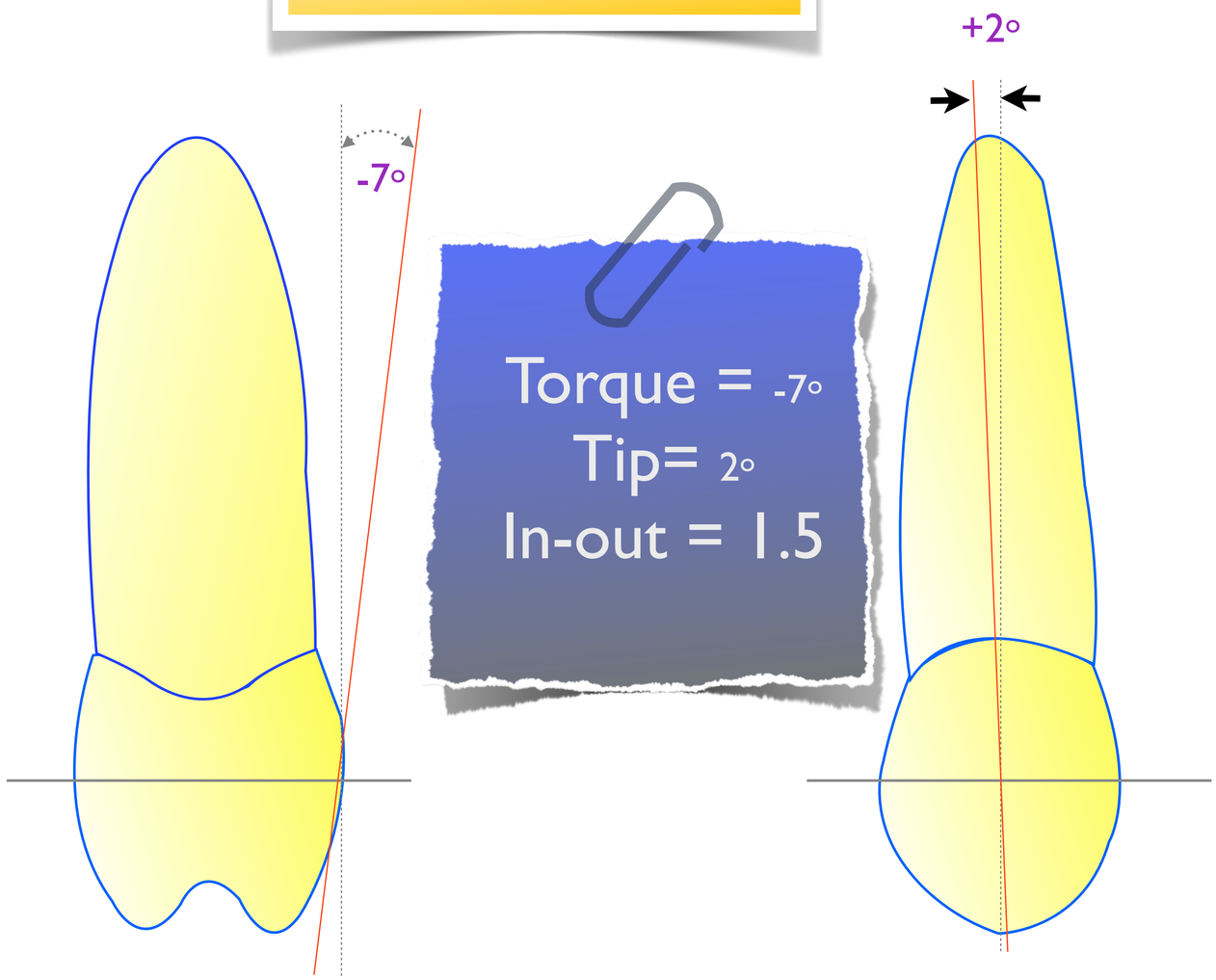
Torque = -7



Bracket manufacturing & Torque Prescription

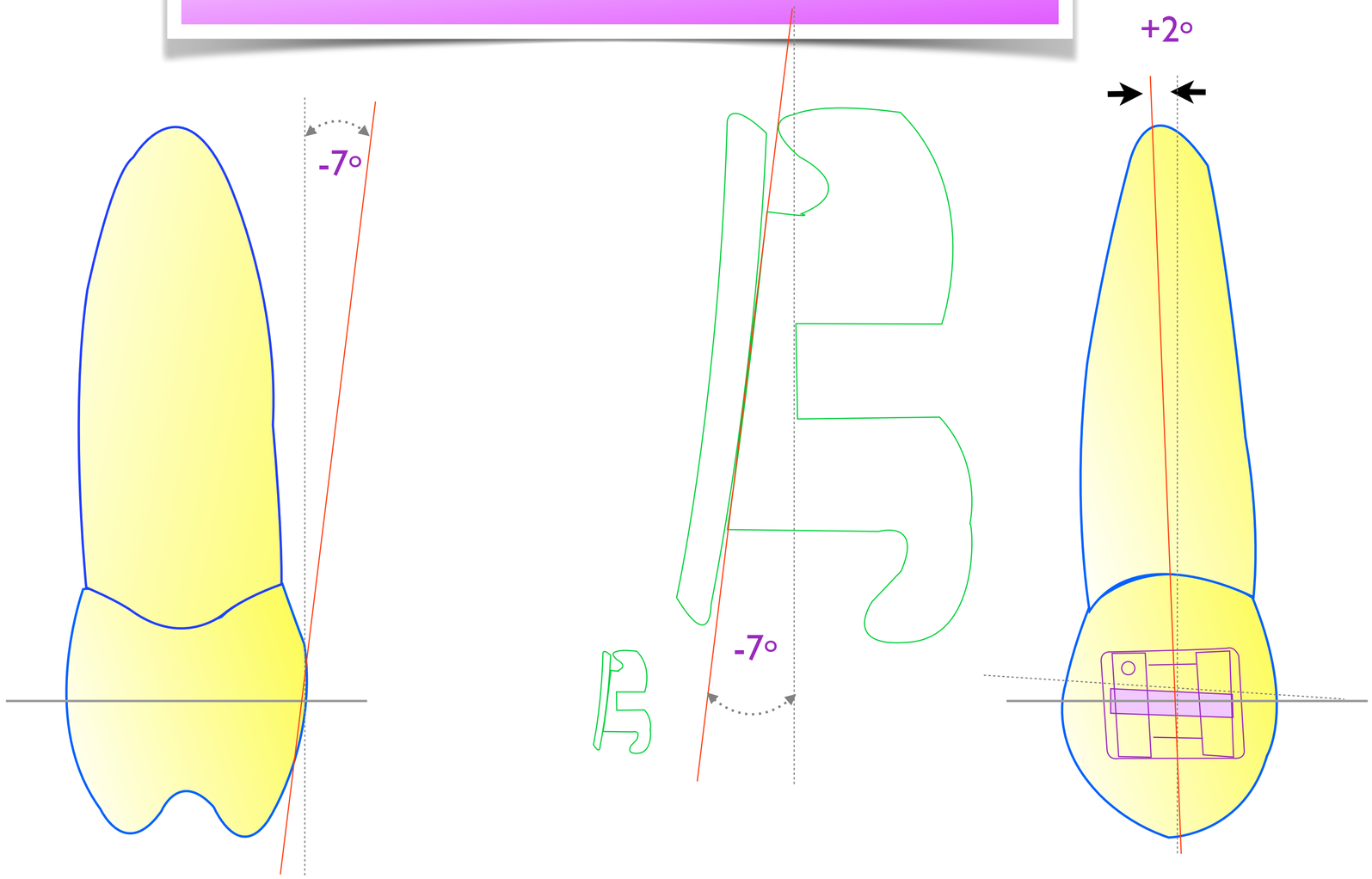


Upper Premolar



Torque = -7°
Tip= 2°
In-out = 1.5

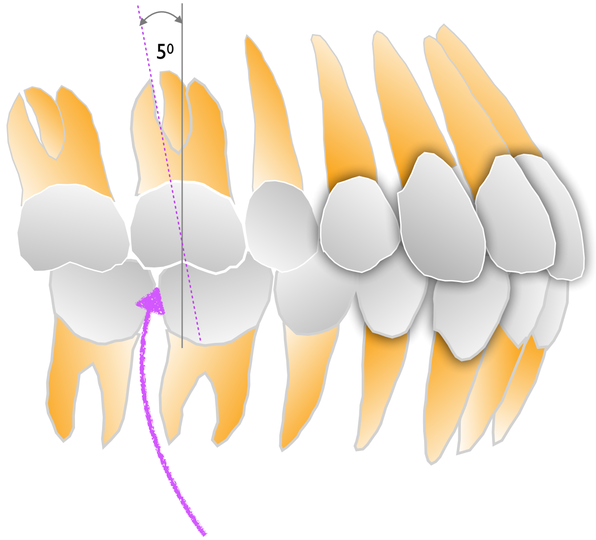
Upper Premolar (Torque & Tip)



Upper Molar Tip

Cl.I

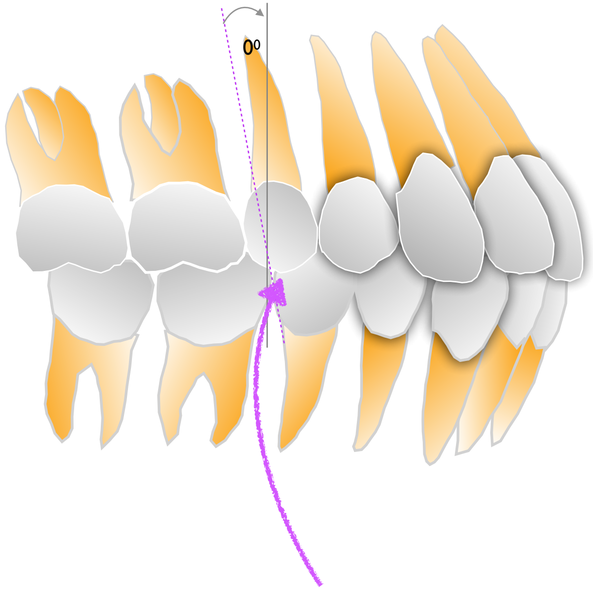
Angulation +5°



DB Cusp of 6/- socket in embrasure btw -/6 and -/7

Cl.II

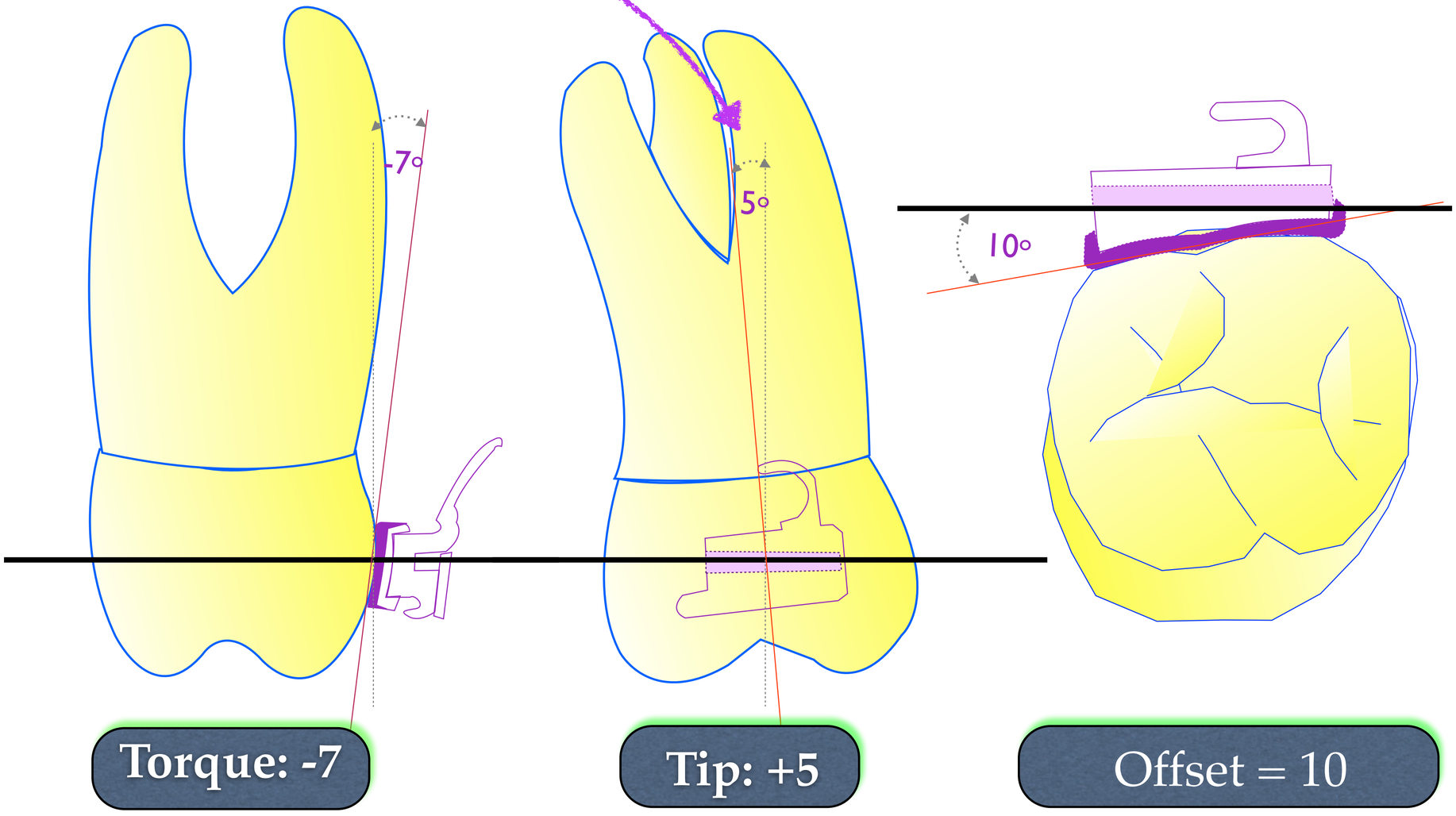
Angulation 0°



MB Cusp of 6/- socket in embrasure btw -/5 and -/6

Upper 1st Molar

Cl.I



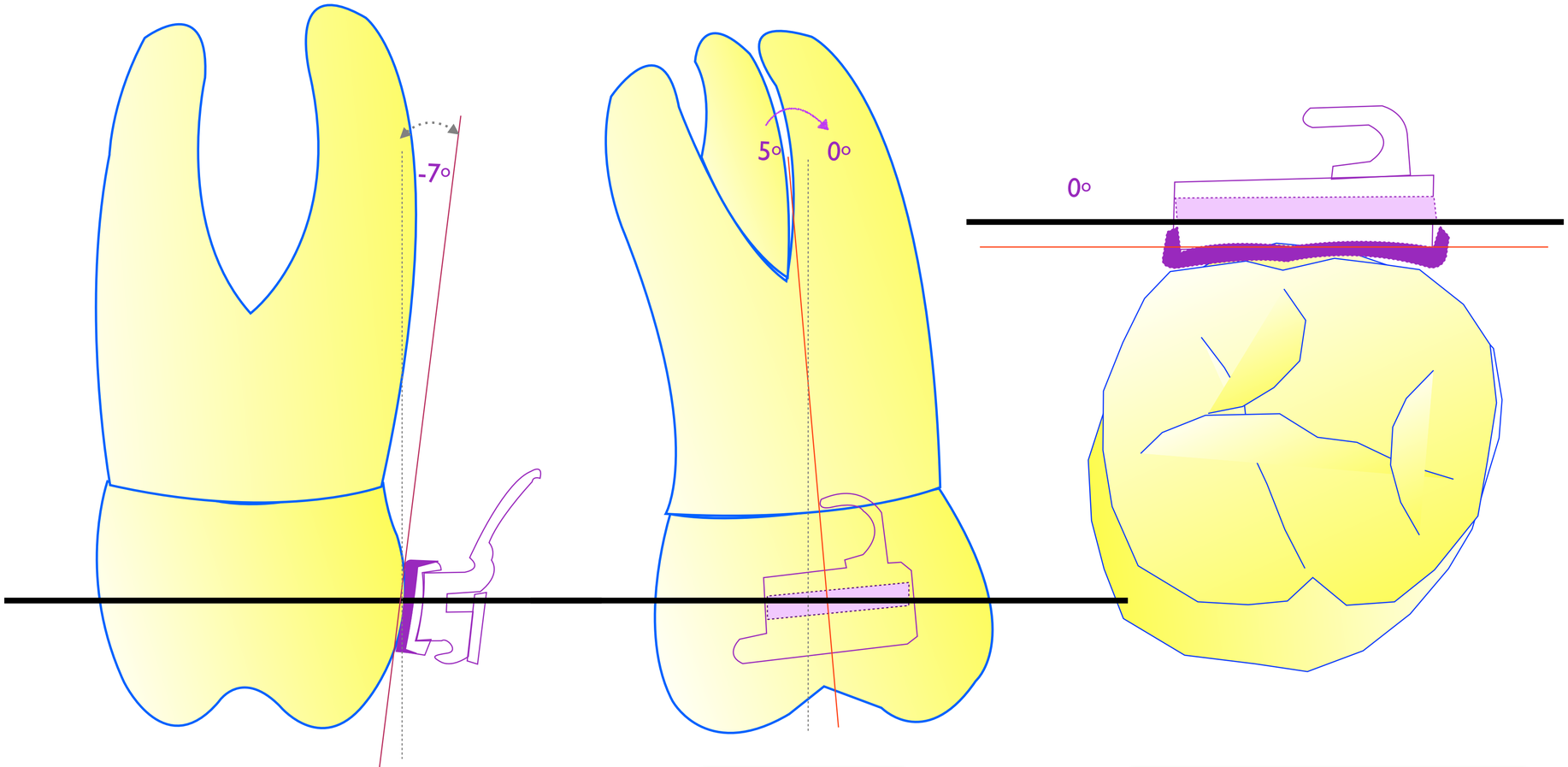
Torque: -7

Tip: +5

Offset = 10

Cl.II

Upper 1st Molar



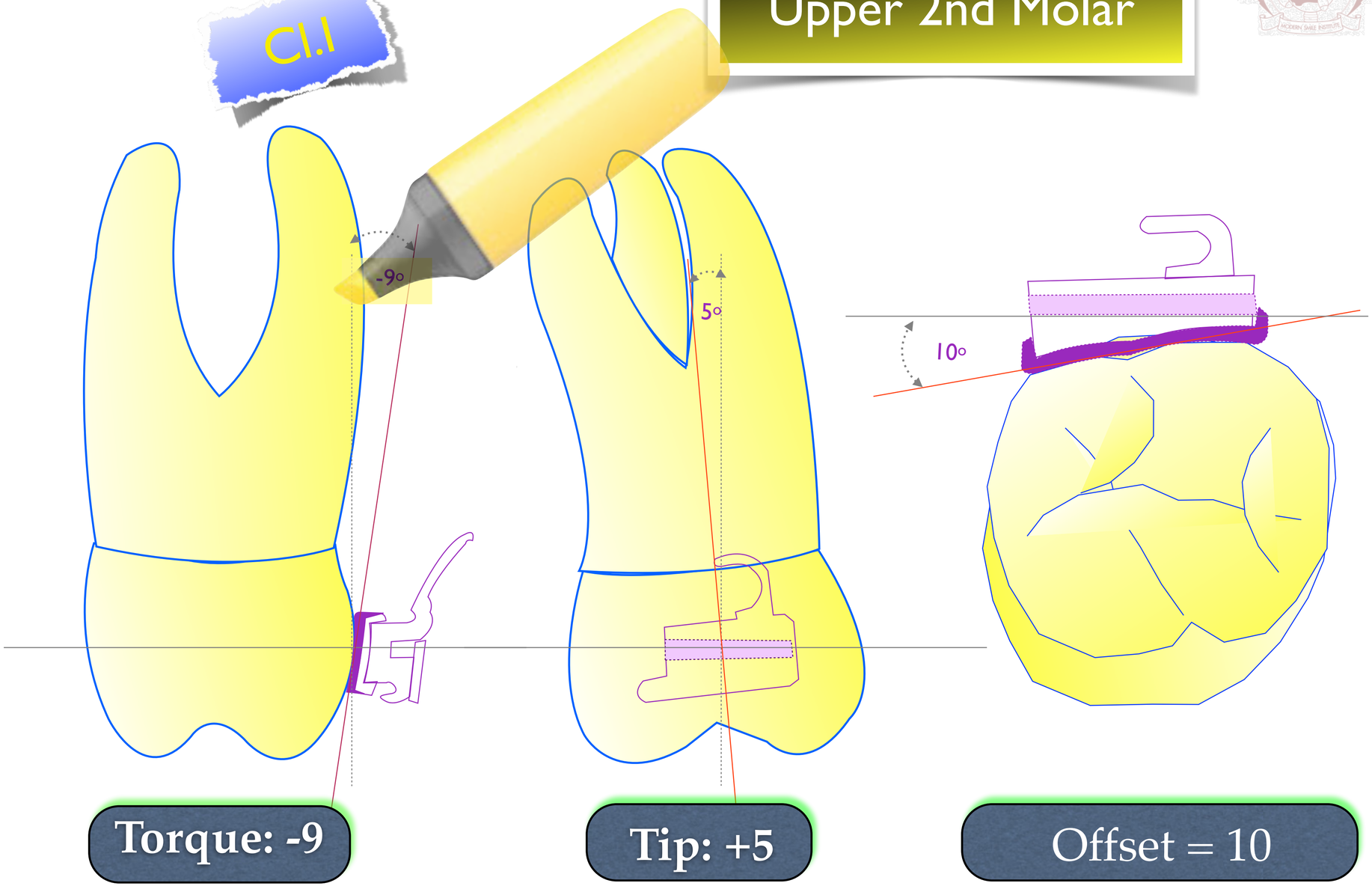
Torque: -7

Tip: +0

Offset = 0

Upper 2nd Molar

Cl.I

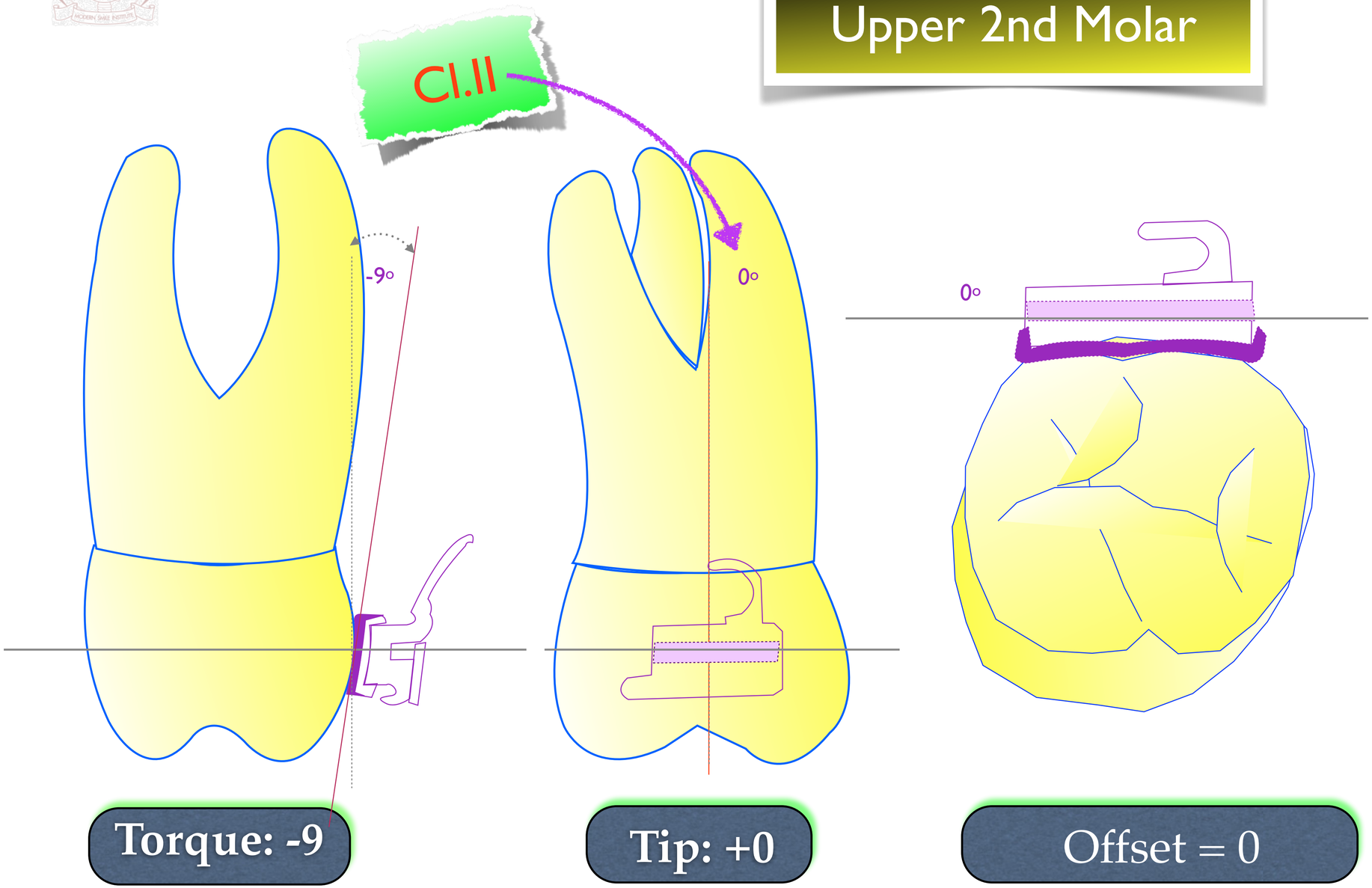


Torque: -9

Tip: +5

Offset = 10

Upper 2nd Molar

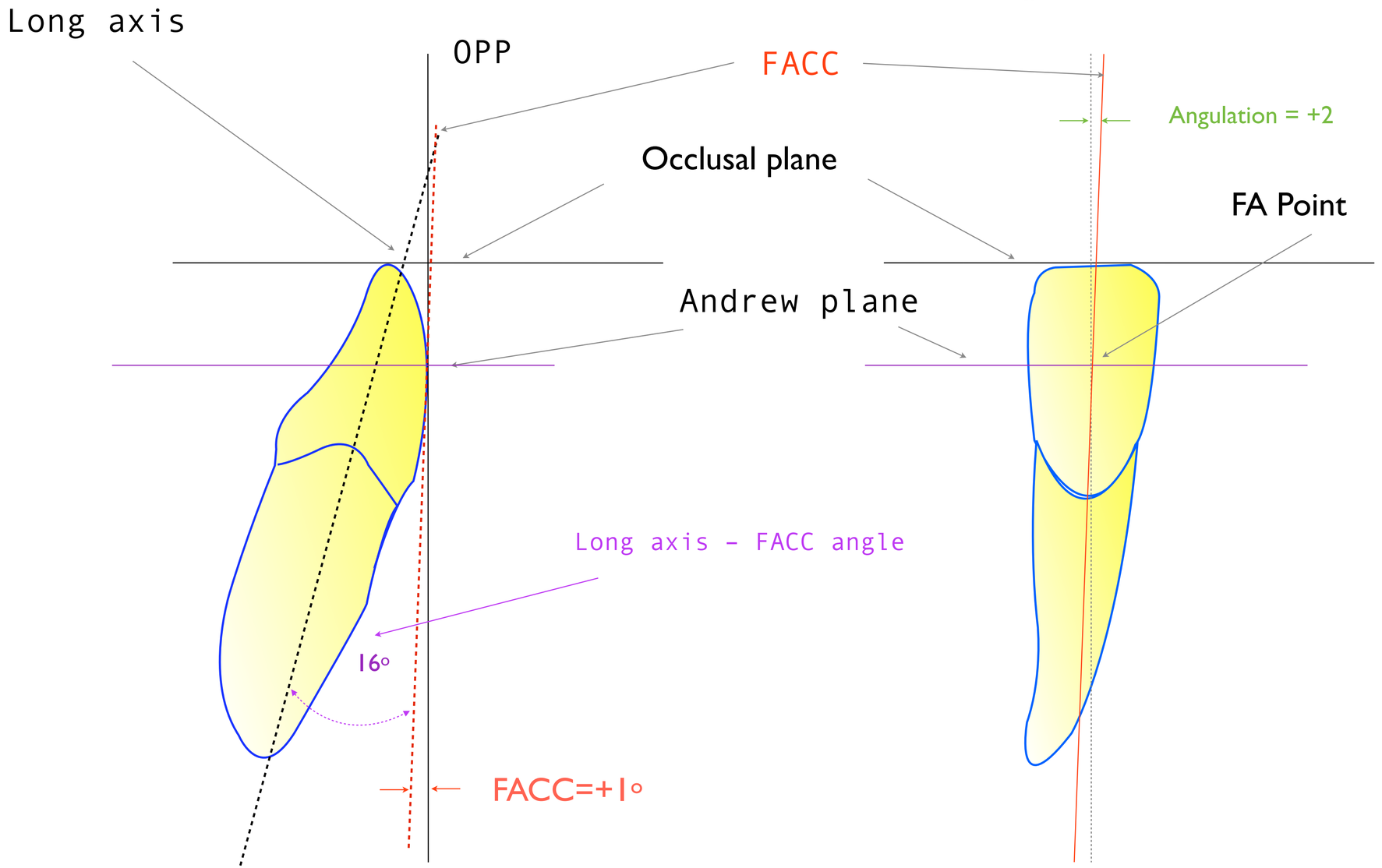


Torque: -9

Tip: +0

Offset = 0

Lower central Incisors



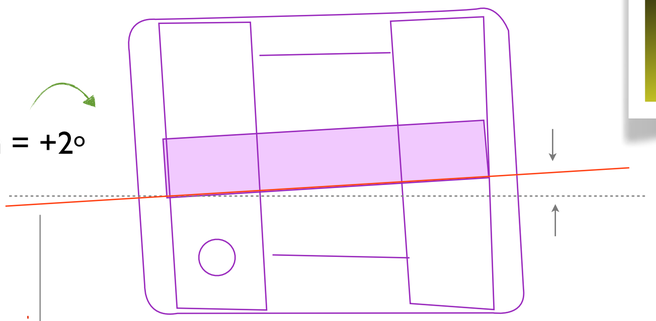
Lower central Incisors

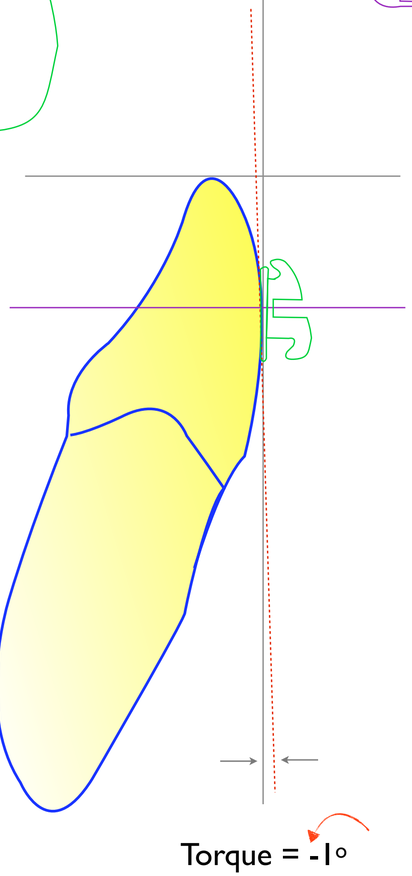
an average difference of FACC - long axis angle is 16^{o}

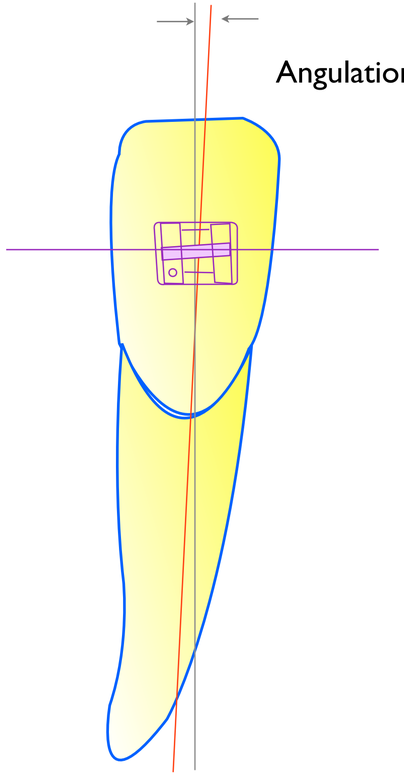
Torque	Tip	In-out
Cl.I : -1 (15-16) Cl.II : +4 (20-16) Cl.III : -6 (10-16)	+2	2.3 mm.

Lower incisors

Cl.I



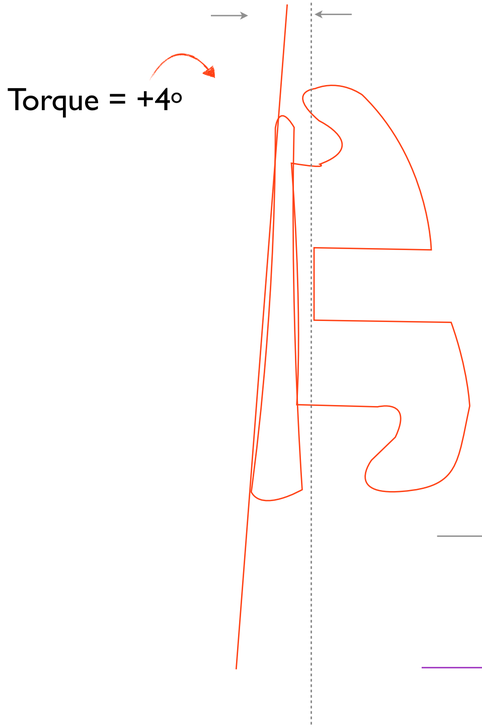


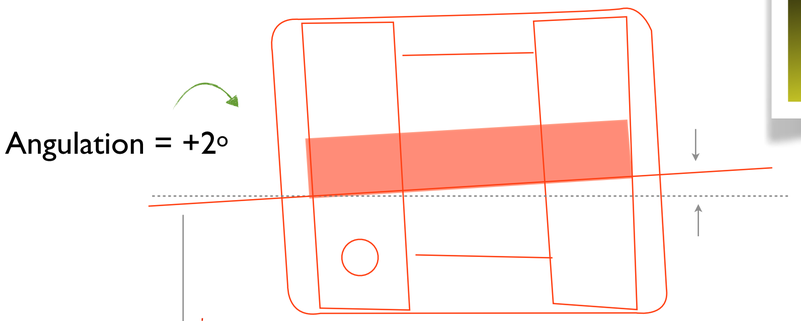


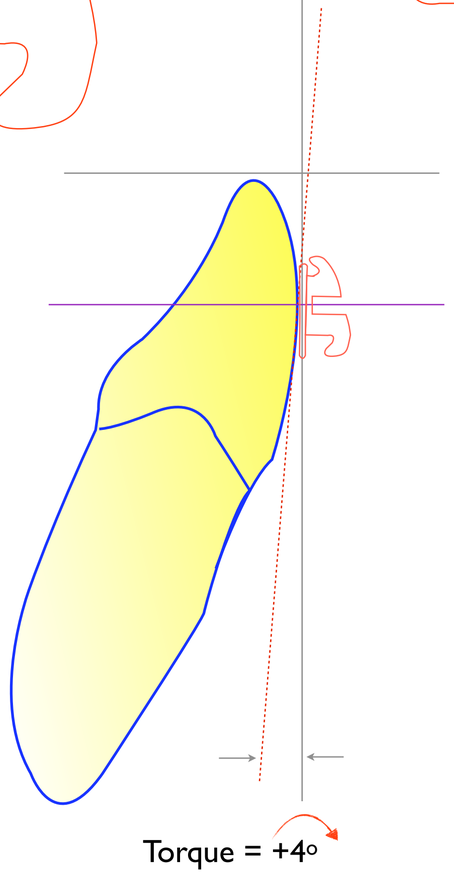
Torque = -1
Tip = +2
In-out 2.3 mm

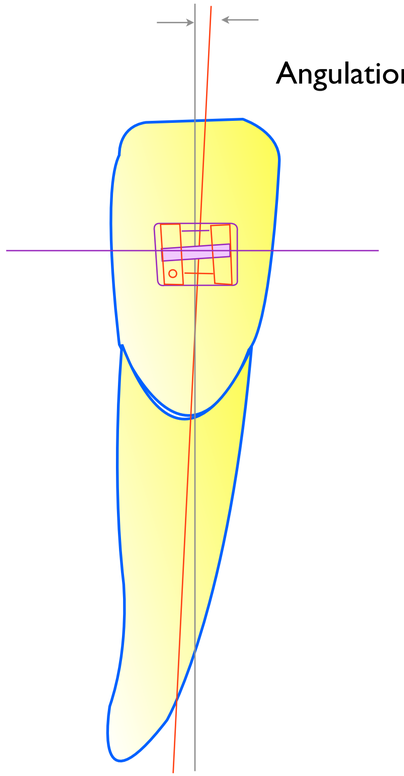
Lower incisors

Cl.II





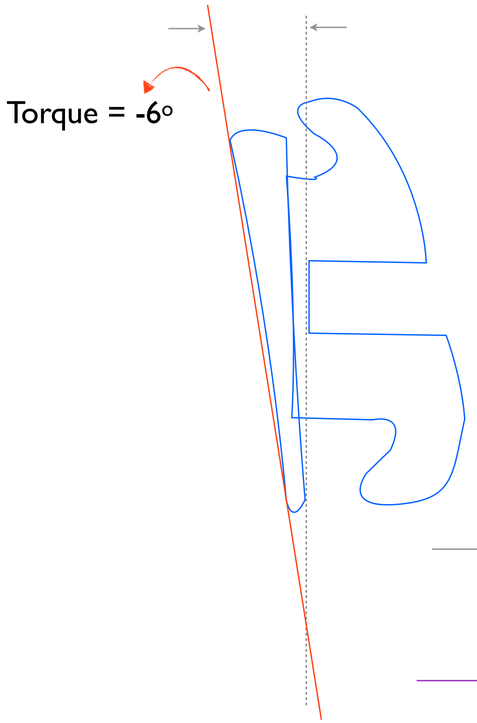


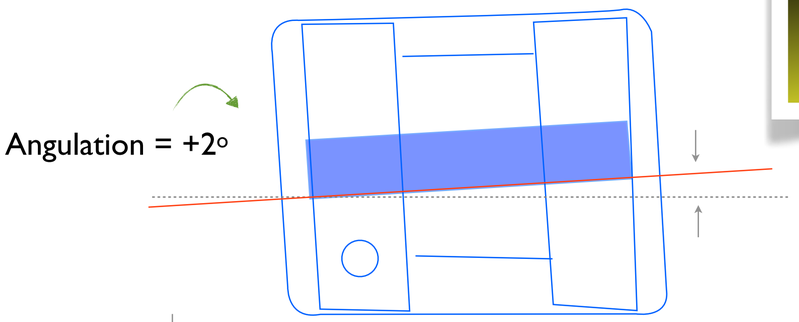


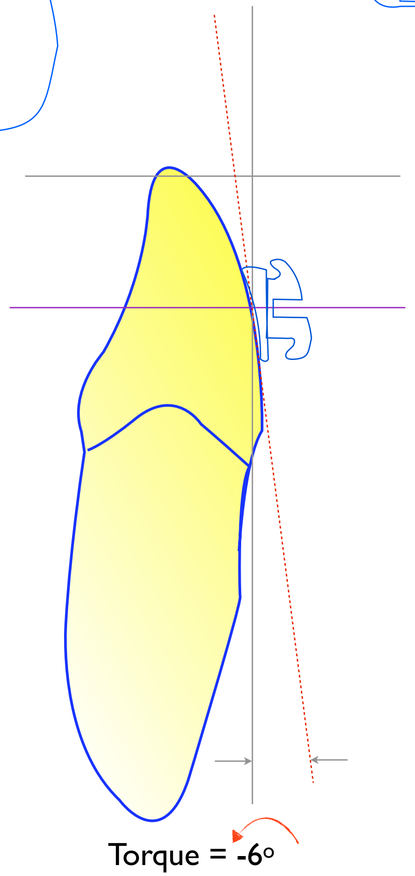
Torque = +4
Tip = +2
In-out 2.3 mm

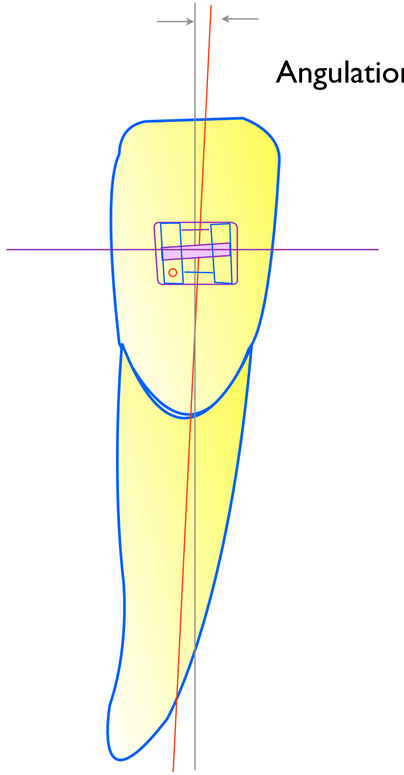
Lower incisors

Cl.III



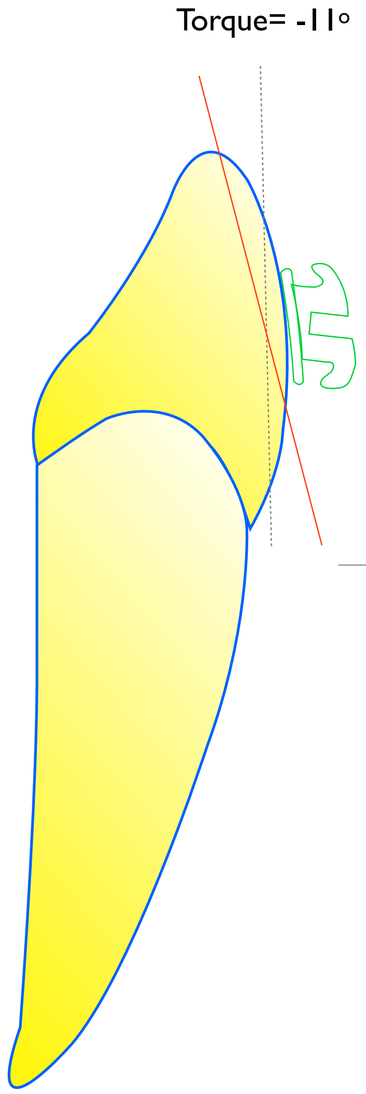


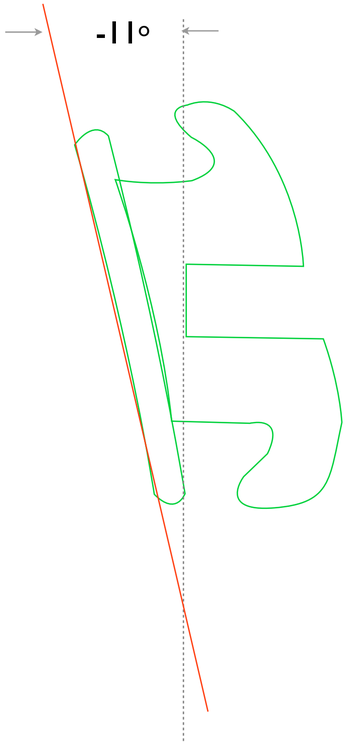


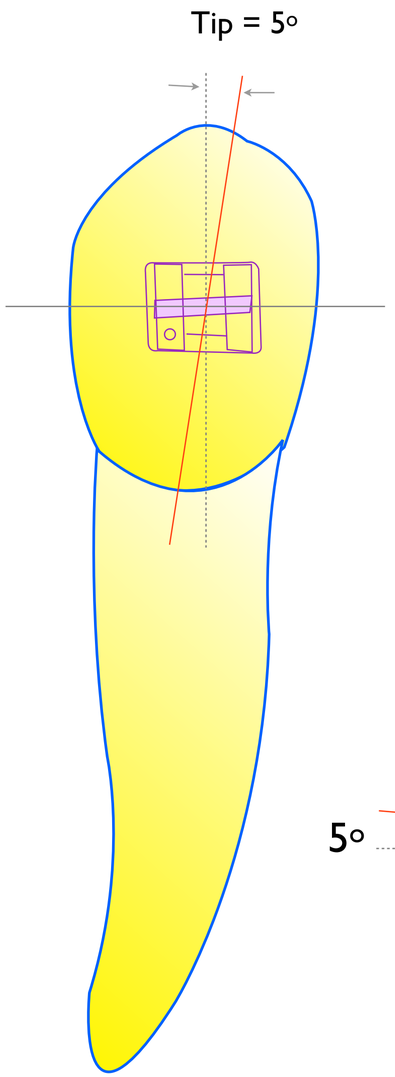


- Torque = -6
- Tip = +2
- In-out 2.3 mm

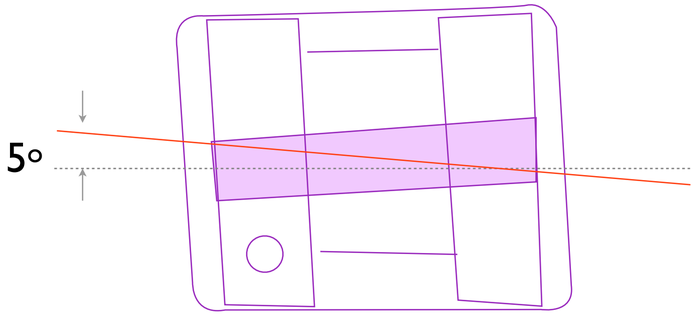
Lower canine



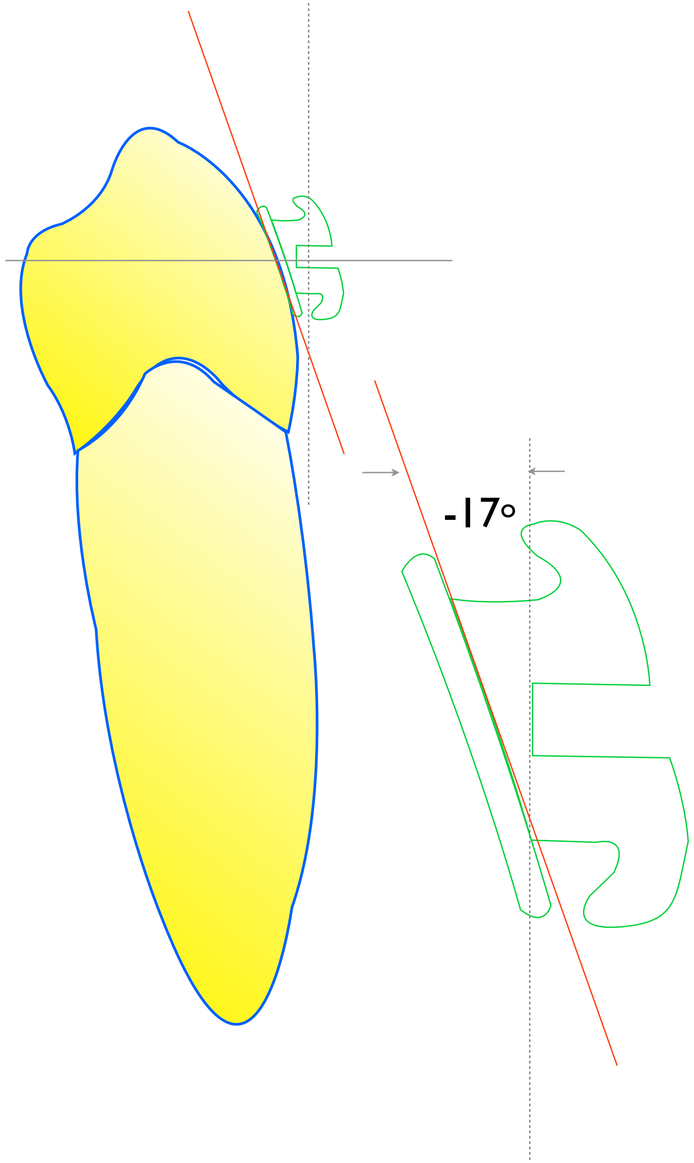


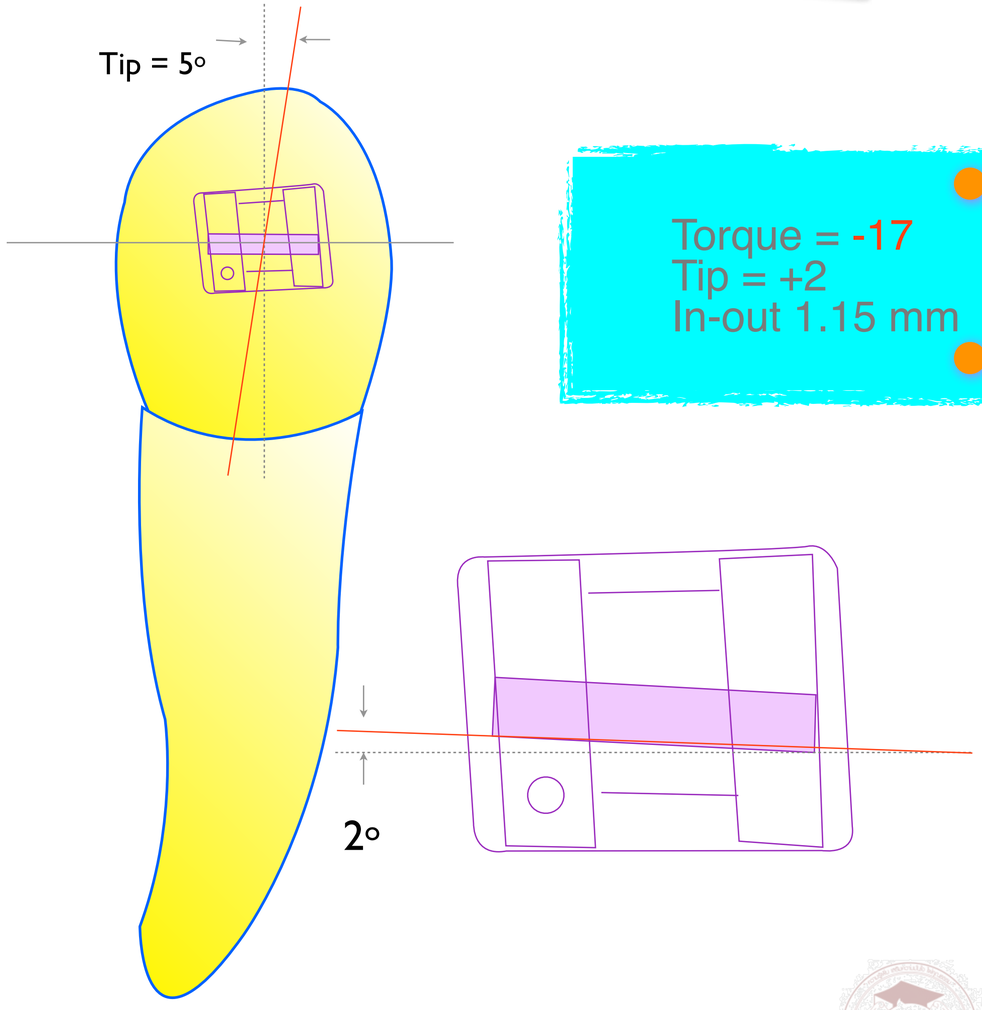


Torque = -11
Tip = +5
In-out 1.6 mm



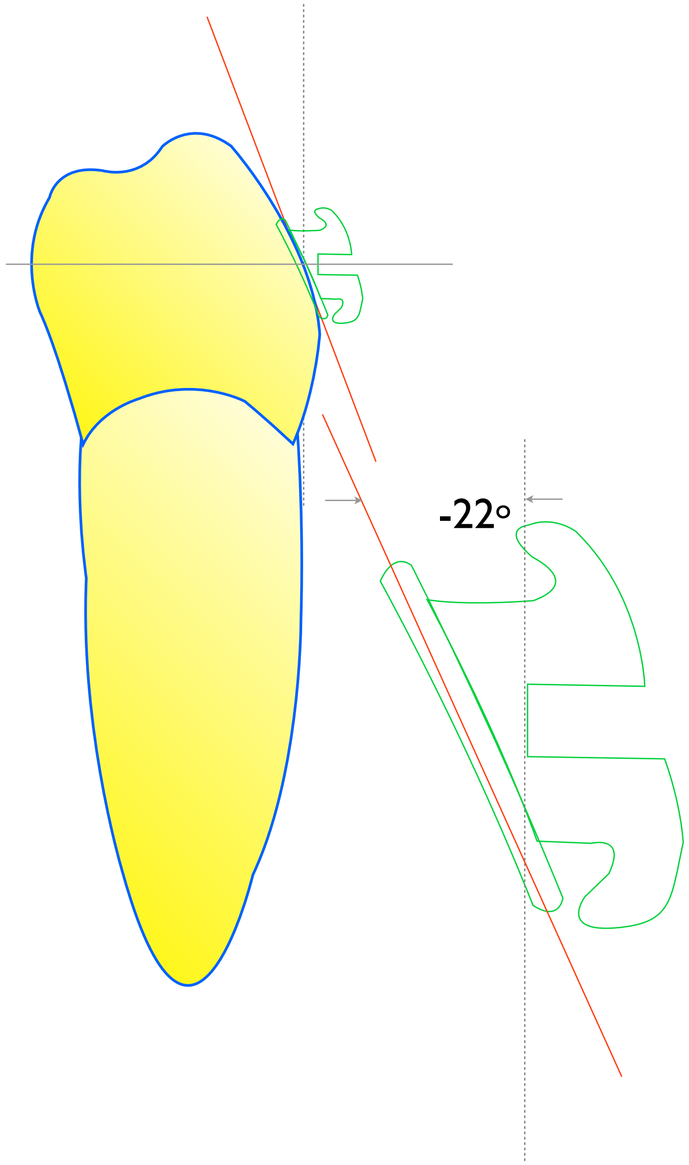
lower 1st Bicuspid

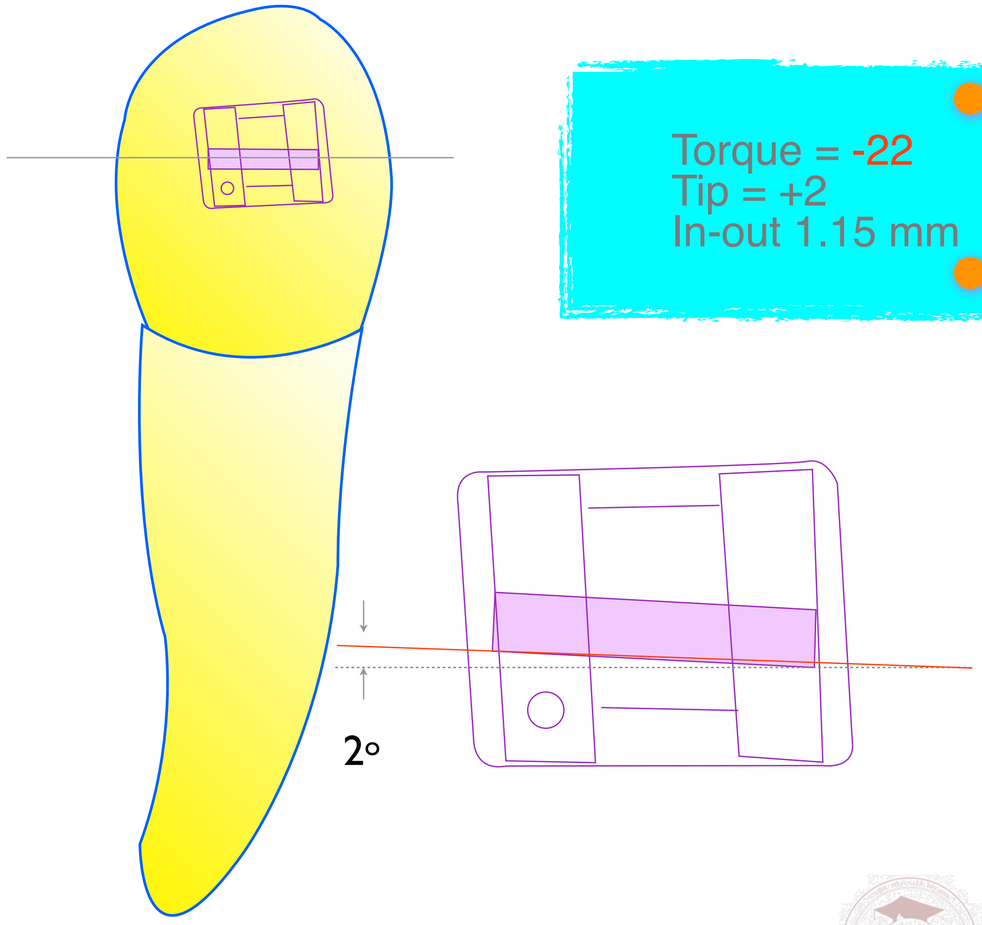




Torque = -17
Tip = +2
In-out 1.15 mm

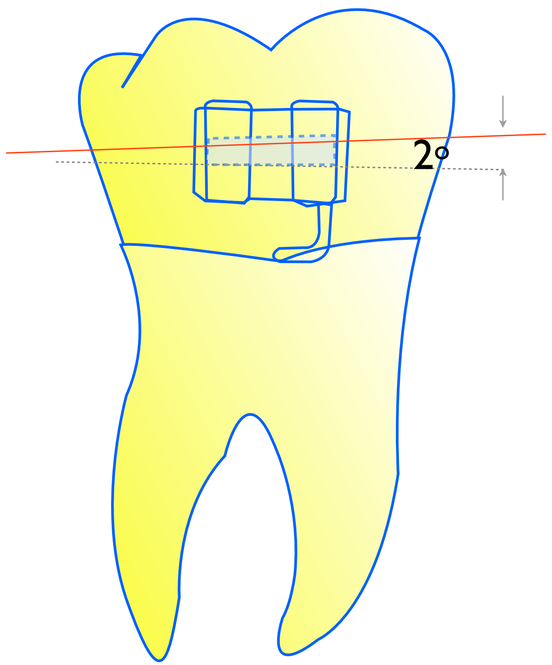
lower 2nd Bicuspid

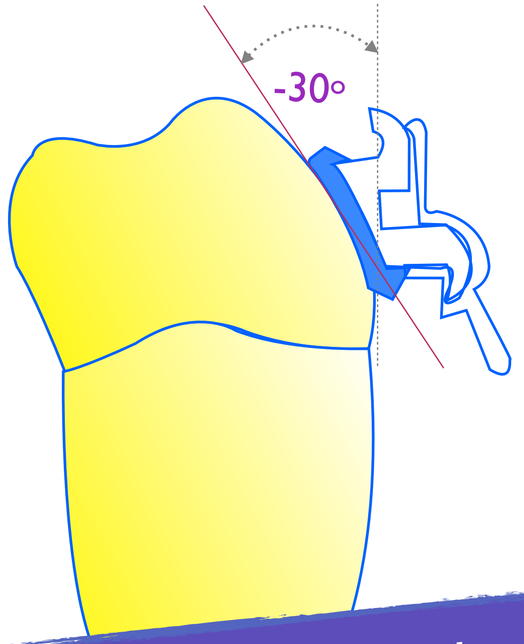




Torque = -22
Tip = +2
In-out 1.15 mm

lower 1st Molar

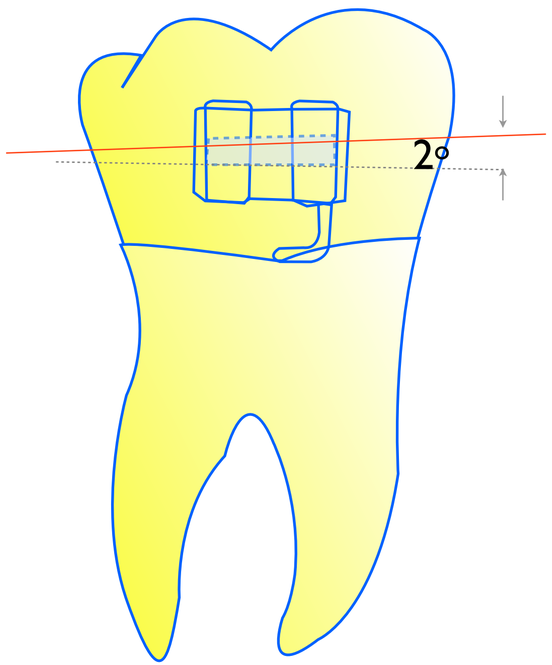


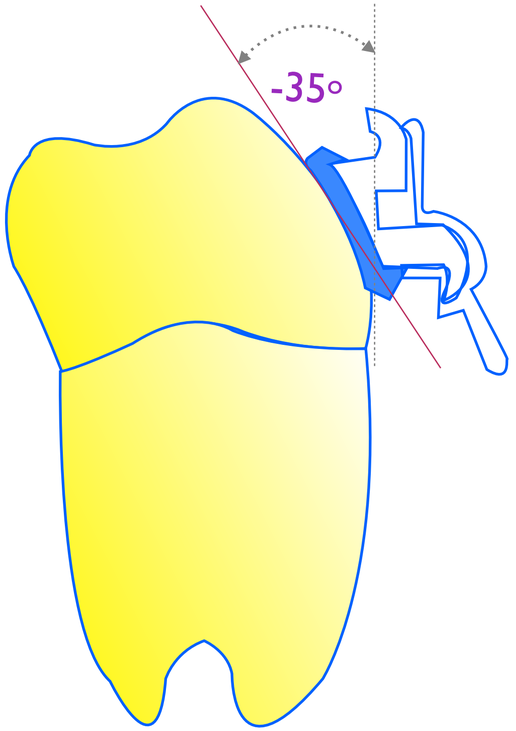


Torque = -30
Tip = +2
In-out 1.0 mm

No Distal Rotation Offset

lower 2nd Molar





Torque = -35
Tip = +2
In-out 1.0 mm

Andrews' Prescription

Upper teeth

		1	2	3	4	5	6	7
	Tip	3.59	8.04	8.4	2.7	2.8	5.7	0.4
Norm's	Torque	6.11	4.42	-7.3	-8.5	-8.9	-11.5	-8.1
	Prominent/offset	2.1	1.65	2.5	2.4	2.5	2.9	2.9
	Tip	5	9	11	2	2	5	5
Cl.I	Torque	7	3	-7	-7	-7	-9	-9
	Prominent/offset	1.8	2.25	1.4	1.5	1.5	1/10°	1/10°
	Tip						2	2
Cl.II	Torque	2	-2				0	0
Cl.III	Torque	12	8					

Andrews' Prescription

Lower teeth

		1,2	3	4	5	6	7
Norm's	Tip	2	2	1.3	1.54	2	2.9
	Torque	-1	-12.7	-19	-23.6	-30.7	-36
	Prominent/offset	1.2	1.9	3.5	2.35	2.5	2.5
Cl.I	Tip	2	5	2	2	2	2
	Torque	-1	-11	-17	-22	-30	-35
	Prominent/offset	2.3	1.6	1.15	1.15	1.15	1
Cl.II	Torque	4					
Cl.III	Torque	-6