Title Slide

- Damon Q to Damon Ultima:
- Is It an Upgrade or a Paradigm Shift?

- Dr. Mohammed-Salih
- Department of Orthodontics
- College of Dentistry – University of Baghdad

Learning Objectives

- • Understand the evolution of the Damon system
- • Describe Damon Q design
- • Explain Damon Ultima innovations
- • Compare biomechanics
- • Evaluate upgrade vs paradigm shift

Introduction

- Passive self-ligating systems were introduced to reduce friction and improve treatment efficiency.

- The Damon System evolved through several generations culminating in Damon Ultima.

Evolution of Damon System

- Damon SL
- Damon 2
- Damon 3 / 3MX
- Damon Q
- Damon Ultima

Damon Philosophy

- • Passive self-ligation
- • Low friction mechanics
- • Light continuous forces
- • Arch development
- • Reduced extractions

Passive Self-Ligation

- Passive self-ligating brackets use a sliding door mechanism instead of elastomeric ligatures.

- Advantages:
- • Reduced friction
- • Faster alignment

Damon Q Overview

- Fourth-generation Damon bracket introduced around 2010.

- Features:
- • Stainless steel construction
- • Passive sliding door
- • 0.022 slot

Damon Q Design

- • Passive sliding mechanism
- • Rectangular slot
- • Conventional rectangular archwire mechanics

Archwire Progression

- Typical sequence:
- • 0.014 CuNiTi
- • 0.018 CuNiTi
- • 0.014×0.025 CuNiTi
- • 0.019×0.025 Stainless Steel

Biomechanics in Damon Q

- • Reduced friction during alignment
- • Torque expressed mainly in finishing wires
- • Rotational control depends on rectangular wire engagement

Limitations of Damon Q

- • Delayed torque expression
- • Rotational play
- • Residual overjet during finishing
- • Binding with larger wires

Clinical Example

- Residual overjet may persist despite Class I molar relation due to incomplete torque expression.

Need for Innovation

- Modern orthodontics requires:
- • Earlier torque control
- • Better rotational control
- • More precise finishing

Introduction to Damon Ultima

- Damon Ultima introduces a redesigned bracket-wire interface aimed at improving three-dimensional control.

Damon Ultima Design

- • Square slot design
- • Square archwires
- • Active slide mechanism
- • Earlier torque expression

Square Slot Concept

- Square slot + square wire = reduced rotational play and improved engagement.

Engineering Difference

- Traditional systems:
- Rectangular wire + rectangular slot

- Ultima:
- Square wire + square slot

Biomechanical Consequences

- • Earlier torque expression
- • Better rotational control
- • Enhanced finishing precision

Torque Expression

- Damon Q:
- Torque mainly expressed during finishing.

- Damon Ultima:
- Torque may begin earlier.

Rotational Control

- Ultima may improve derotation and stability during alignment.

Finishing Stage

- Improved engagement may allow more accurate root positioning and finishing.

Claimed Advantages

- • Faster alignment
- • Better rotational control
- • Reduced wire changes
- • Improved finishing

Scientific Evidence

- Current evidence remains limited.
- Most available reports are manufacturer-based or laboratory simulations.

Damon Q vs Ultima

- Comparison:
- • Slot geometry
- • Wire geometry
- • Torque timing
- • Rotational control

Upgrade Perspective

- Ultima may represent an upgrade because it maintains the same treatment philosophy and PSL concept.

Paradigm Shift Perspective

- Ultima may represent a paradigm shift because of the new slot-wire mechanics and earlier 3D control.

Clinical Decision Making

- Clinicians should consider:
- • Case complexity
- • Torque requirements
- • Rotational severity
- • Scientific evidence

Future Research

- Further studies needed:
- • Randomized clinical trials
- • Long-term outcomes
- • Independent biomechanical analysis

Key Take-Home Messages

- • Damon Q remains reliable
- • Damon Ultima introduces new mechanics
- • Clinical superiority still under investigation

Conclusion

- Damon Ultima represents a major engineering innovation.
- Whether it is a true paradigm shift depends on future evidence.