Masterclass in Clinical Practice

Endodontics

with
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Maximizing efficiency and preservation in root canal therapy: the Reciproc Minima system

Introduction

In recent years, endodontic treatment techniques have evolved significantly, focusing on efficiency, minimal invasiveness, and maximal preservation of dental structures. The Reciproc Minima system, introduced by VDW in 2025, represents a significant advancement in root canal instrumentation. It builds upon the foundational principles established by its predecessors, including the original Reciproc system (VDW) and Reciproc Blue (VDW), providing enhanced flexibility and optimized shaping characteristics.

The Evolution of Reciproc Systems

The Reciproc concept was first introduced in 2008 by Prof. Ghassan Yared, pioneering a paradigm shift in root canal treatment by utilizing a single-file reciprocating system. This advancement allowed for effective canal shaping with fewer procedural steps and reduced reliance on glide path enlargement compared to traditional rotary techniques (Yared, 2008).

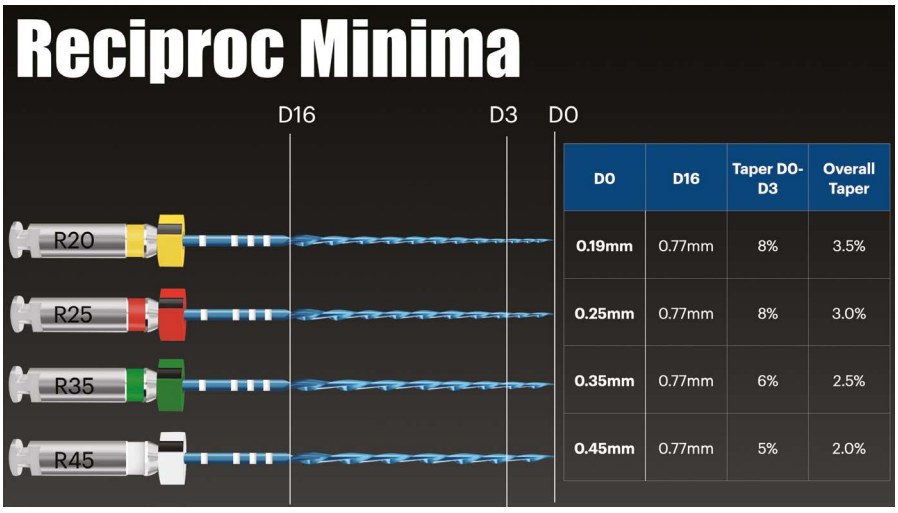
In 2016, VDW launched Reciproc Blue, employing a thermally treated nickel-titanium (NiTi) alloy to enhance flexibility and cyclic fatigue resistance (Topçuoğlu et al., 2018). This innovation contributed to a new standard in endodontics, prioritising efficient and conservative canal preparation.

The Reciproc Minima file system (VDW)(2025) is designed for minimally invasive shaping, better preservation of pericervical dentine, and improved negotiation of anatomically challenging canals (e.g., long, calcified, or highly curved anatomies) while maintaining the familiar reciprocating philosophy.

The Reciproc Minima file system (VDW) is developed to:

1. Reduce unnecessary dentine removal, preserving pericervical and mid-root dentine.
2. Maintain reciprocation advantages: less cyclic fatigue, simpler instrumentation sequences.
3. Enhance manageability in complex anatomy, especially in narrow or calcified canals.

These design goals align with modern biological shaping protocols prioritising minimal intervention yet thorough debridement.



D0	D16	Taper D0-D3	Overall Taper
0.19mm	0.77mm	8%	3.5%
0.25mm	0.77mm	8%	3.0%
0.35mm	0.77mm	6%	2.5%
0.45mm	0.77mm	5%	2.0%

Figure 1: Different file sizes available, the tip diameter at D0, the maximum flute diameter at D16, the taper increase from D0-D3, and overall taper of the file.

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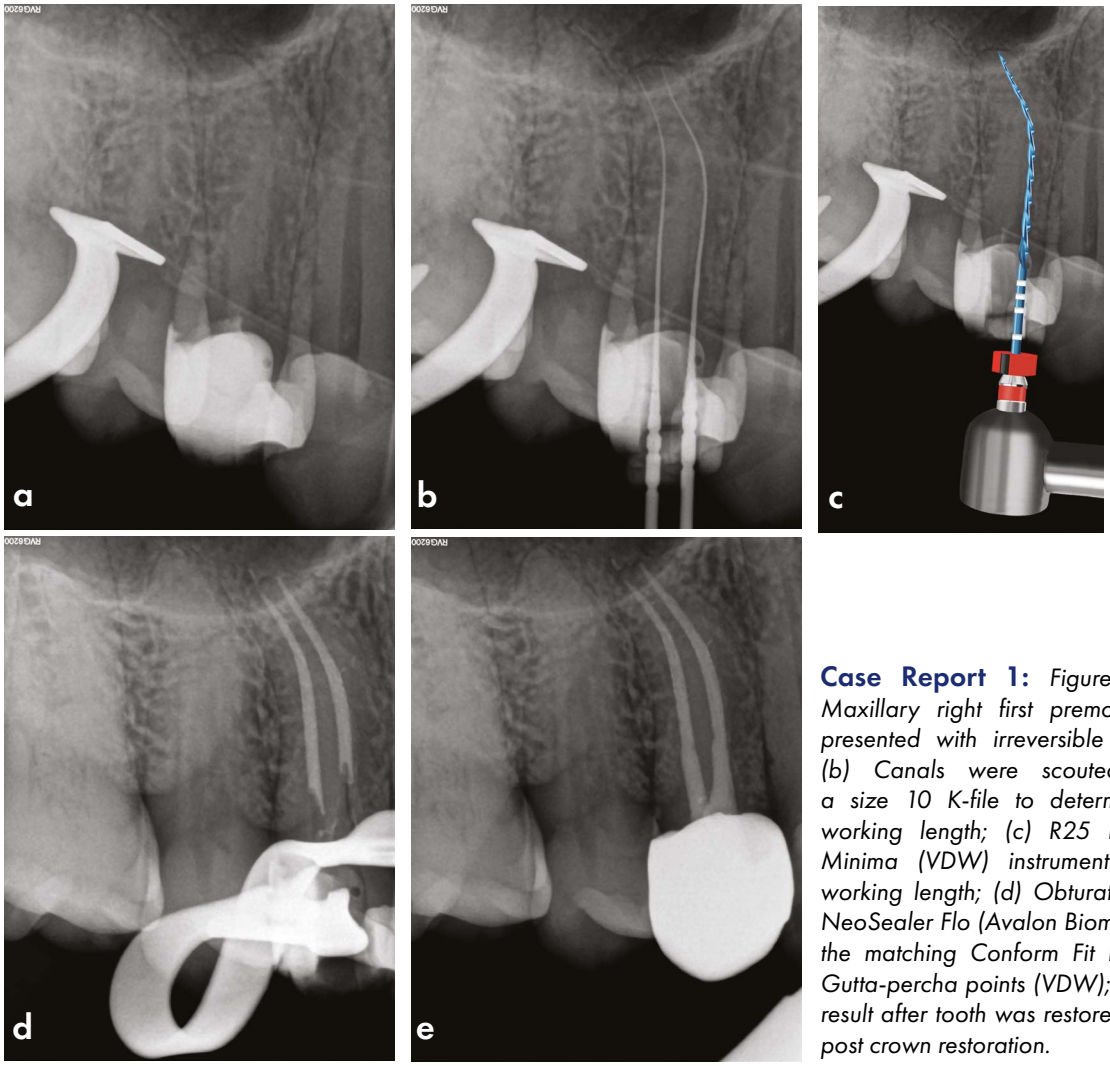


Case Report 1: *Figure 2: (a) Maxillary right first premolar that presented with irreversible pulpitis; (b) Canals were scouted using a size 10 K-file to determine the working length; (c) R25 Reciproc Minima (VDW) instrument to full working length; (d) Obturation with NeoSealer Flo (Avalon Biomed) and the matching Conform Fit Reciproc Gutta-percha points (VDW); (f) Final result after tooth was restored with a post crown restoration.*

File Geometry, Sizes, and Tapers

- The system consists of a R20, R25, R35, and R45 instruments, providing graduated options from very narrow to medium and large canals.
- Variable taper profile that prioritises limited taper coronally, extending apical enlargement only where necessary.
- Retention of S-shaped cross-section common to the Reciproc family — optimising cutting efficiency and debris transport while reducing stress concentration.
- Shortened shank improving posterior molar access in restricted operatory spaces.
- Figure 1 depicts the different file sizes available, the tip diameter at D0, the maximum flute diameter at D16, the taper increase from D0-D3, and overall taper of the file.

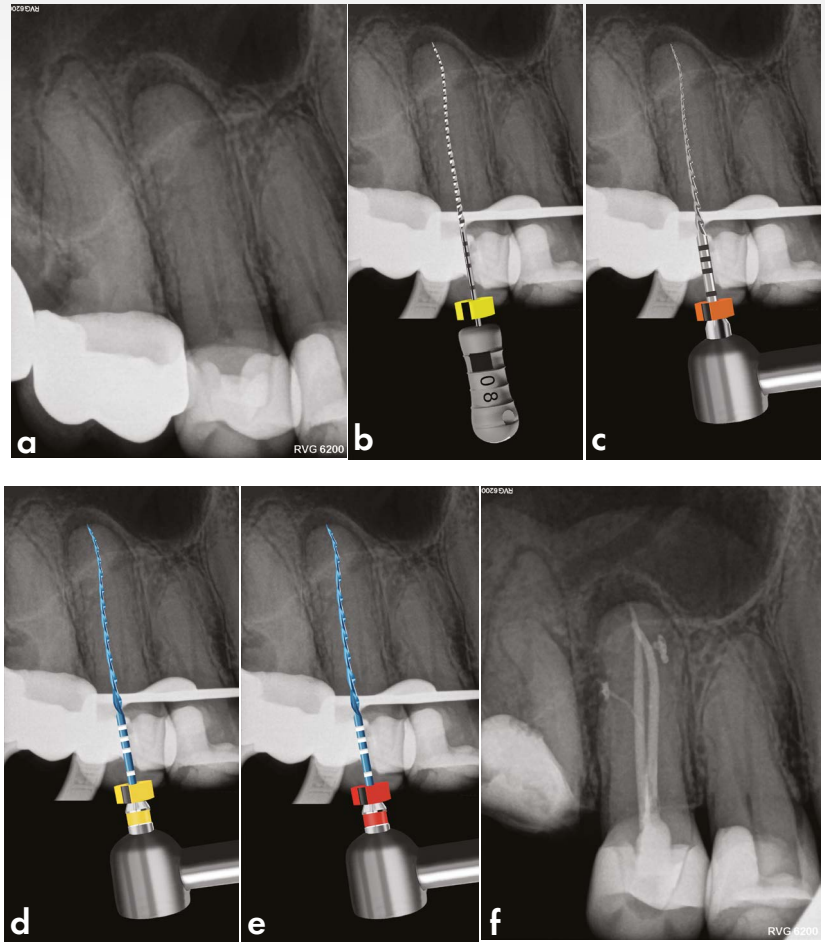
Metallurgy & Motion

- Heat-treated NiTi alloy for improved flexibility and higher resistance to cyclic fatigue.
- Reciprocating kinematics: alternating clockwise and counter-clockwise rotations that reduce cyclic and torsional stresses compared to continuous rotation. This improves file longevity and reduces fracture risk in curved canals.
- Single-file operational ethos: simplifying instrumentation and minimizing file exchanges.

Case Report 1

A 53-year-old male presented with irreversible pulpitis in his maxillary right first premolar (Figure 2a). After preparing the access cavity, both a buccal and palatal canal orifice were located. The canals were scouted using a size 10 K-file to determine the working length (Figure 2b). At a subsequent visit, canal preparation (without glide path preparation) was initiated with an R25 Reciproc Minima (VDW) instrument to full working length (Figure 2c), employing three pecking motions at a time before canal irrigation, recapitulation, and re-irrigation prior to the next cutting cycle in each root canal system.

Reciproc Minima gutta-percha cones (VDW) were fitted, and the prepared root canals were irrigated with sodium hypochlorite and EDTA before obturation. Obturation was done with NeoSealer Flo (Avalon Biomed) and the matching Conform Fit Reciproc Gutta-percha points



Case Report 2: *Figure 3: (a) preoperative periapical radiograph of the non-vital maxillary right second premolar; (b)Canals were scouted using a size 08 K-file to determine the working length; (c) Glyde path was prepared using an R-Pilot reciprocating glide path instrument (VDW); (d) Canal preparation was initiated with an R20 Reciproc Minima instrument (VDW); (e)R25 Reciproc Minima instrument (VDW); (f) Final post-operative result after obturation. Note the midroot and apical lateral canals.*

Case Report 2

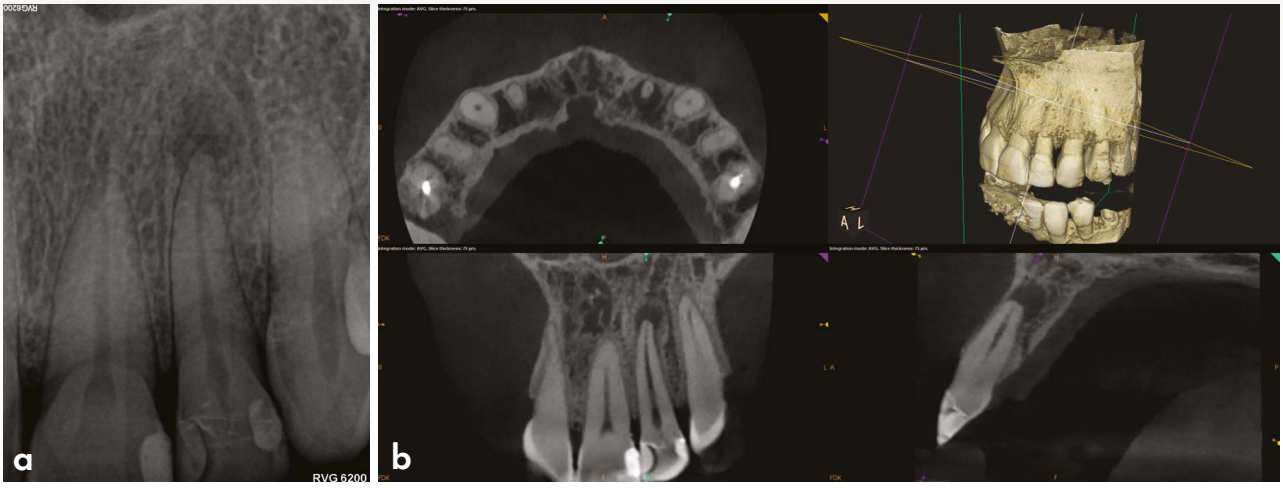
The patient, a 67-year-old female, presented with a non-vital maxillary right second premolar that had been restored with a crown. After preparing the access cavity, both a buccal and palatal canal orifice were located.

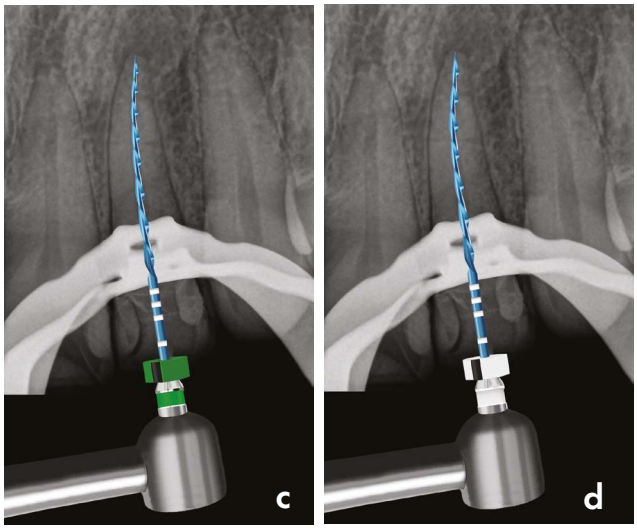
The canals were scouted with a size 08 K-file to determine the working length. A glide path was prepared using an R-Pilot reciprocating glide path instrument (VDW). Canal preparation was initiated with an R20 Reciproc Minima instrument (VDW), followed by an R25 Reciproc Minima instrument (VDW) to full working length, employing three pecking motions at a time before canal irrigation, recapitulation, and re-irrigation prior to the next cutting cycle.

The prepared root canals were irrigated with sodium hypochlorite and EDTA before obturation with Pulp Canal Sealer EWT (Kerr) and matching Conform Fit Gutta-percha points (VDW), using the continuous wave of condensation technique with the Gutta Smart System (Dentsply Sirona).

Case Report 3

The patient a 63-year-old female presented with a non-vital maxillary left lateral incisor. A high resolution CBCT scan confirmed a periapical lesion around the root of the tooth. After access cavity preparation a size 30 K-file fitted loose in the canal up to full working length. A R35 Reciproc Minima file (VDW) was used to initiate canal preparation and it progressed immediately to working length. Canal preparation was completed with the R40 Reciproc Minima instrument. The fit of a size R40 Reciproc Minima Conform Fit Gutta percha point (VDW) was confirmed radiographically. After irrigation the canal was obturated using Pulp Canal Sealer EWT (Kerr) and Conform Fit Gutta-percha points (VDW) utilising the Gutta Smart System (Dentsply Sirona).

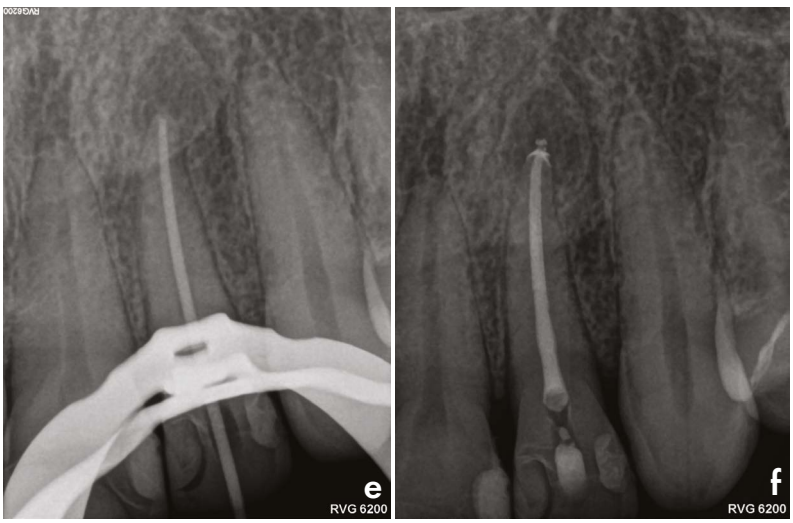




Case Report 3: *Figure 4: (a) Pre-operative periapical radiograph of the non-vital maxillary left lateral incisor; (b) A high resolution CBCT scan confirmed a periapical lesion around the root of the tooth (arrows); (c) R35 Reciproc Minima file (VDW); (d)R40 Reciproc Minima instrument; (e) R40 Reciproc Minima Conform Fit Gutta percha point (VDW) was confirmed radiographically; (f) Immediate Post-operative result after obturation.*

Conclusion

Reciproc Minima (VDW) is a timely addition to the reciprocating file family, blending minimalistic shape philosophy with the proven reciprocating advantages of Reciproc (VDW) and Reciproc Blue (VDW). It supports modern endodontic goals: efficient shaping, reduced procedural risk and preservation of dentine, while retaining clinical workflows familiar to practitioners experienced in reciprocation.



References

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