



# A Diagnostic and Therapeutic Roadmap for Hereditary Dentin Disorders: What Every Prosthodontist Should Know.

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## Introduction

Dentinogenesis Imperfecta (DI) and Dentin Dysplasia (DD) are rare hereditary disorders of dentin that compromise both **esthetics** and **function**. Affected teeth often appear **discolored and brittle, with rapid wear, early pulp obliteration, and eventual tooth loss**. These clinical manifestations pose significant prosthodontic challenges, necessitating individualized and multidisciplinary treatment planning. This poster highlights the essential prosthodontic considerations and therapeutic strategies for managing DI and DD and presents a structured decision-making tree to guide clinical practice.

## Materials and Methods

A comprehensive literature review was performed using PubMed, Cochrane, and Scopus databases. Search terms included “Dentinogenesis Imperfecta,” “Dentin Dysplasia,” and “prosthodontic treatment.” Relevant clinical studies, reviews, and case reports were analyzed. Findings were synthesized into a clinical decision tree based on phenotype severity and corresponding treatment protocols.

| Dentinogenesis Imperfecta (DI) | Dentin Dysplasia (DD) |
|--------------------------------|-----------------------|
|--------------------------------|-----------------------|

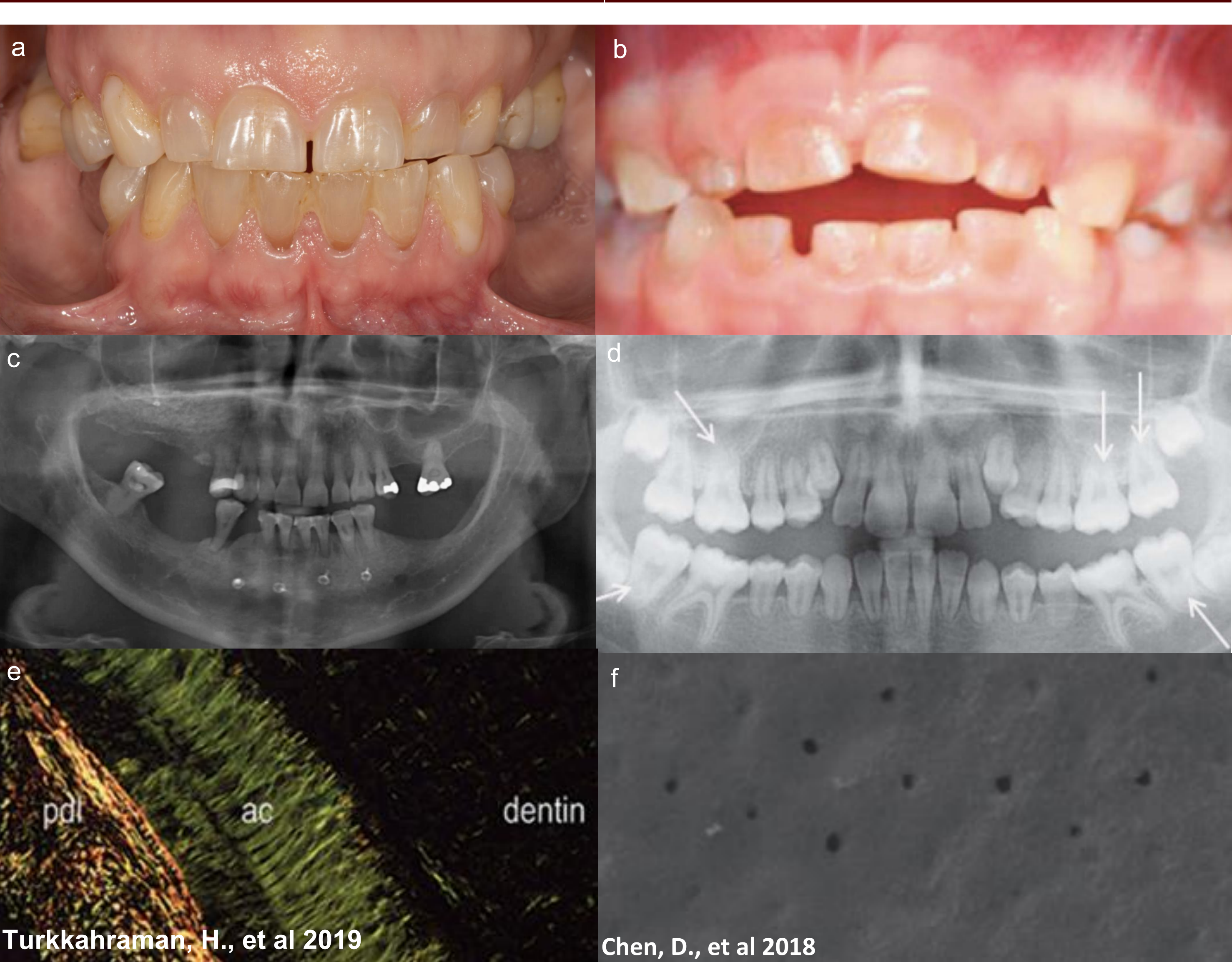


**Figure 1:** Clinical, radiographic, and histologic appearance of DI (a,c,e) and DD (b,d,f). (a) clinical phenotype Of DI patient, showing varying degrees of discoloration and opalescence. (c) Radiographic presentation, note the short, blunted roots. (e) IHC section of a DI tooth. Note the widening of the cementum and PDL space. (b) Clinical phenotype of DD pt. (d) Radiographic presentation of DD pt, note the normal shape and contour of the anatomical crown. (f) SEM of dentinal tubules in DD, note the constricted size.

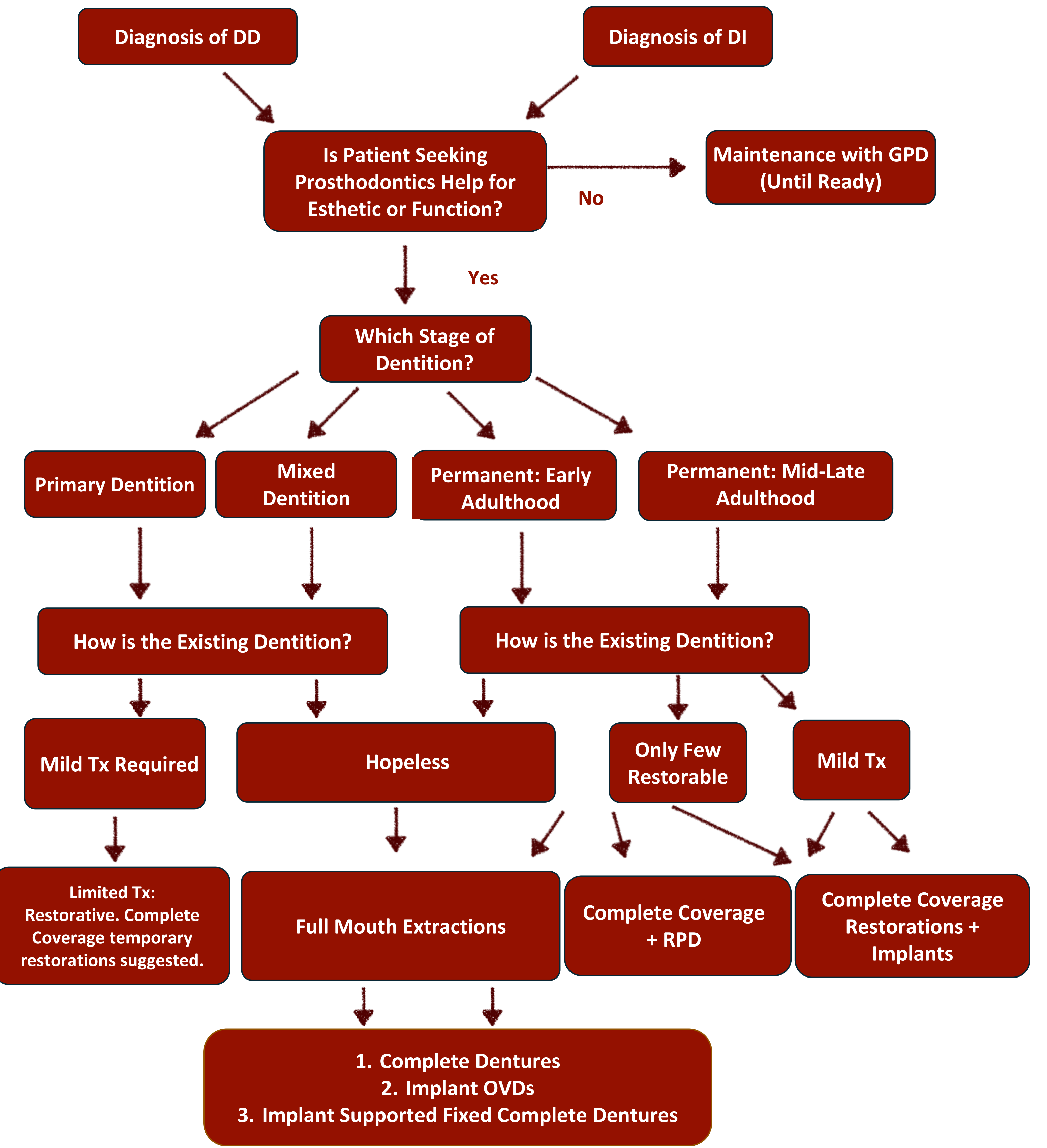
## Results

| Feature                                  | Dentinogenesis Imperfecta (DI)                                                                               | Dentin Dysplasia (DD)                                                              |
|------------------------------------------|--------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| <b>Types:</b>                            | I- Associated with OI<br>II- Classic Presentation of DGI<br>III- Brandywine Isolate, rare                    | I: Radicular<br>II: Coronal                                                        |
| <b>Etiology</b>                          | Hereditary dentin defect; may be isolated (Type II, III) or associated with Osteogenesis Imperfecta (Type I) | Hereditary dentin defect, independent of systemic disease                          |
| <b>Histology:</b>                        | Early stage shows abnormal dentin formation, eventual pulpal obliteration.                                   | Normal Histology                                                                   |
| <b>Tooth Color</b>                       | Opalescent, amber-brown, or bluish-gray                                                                      | Normal or slightly amber in DD-I (radicular); may be discolored in DD-II (coronal) |
| <b>Crown Morphology:</b>                 | Bulbous crowns with cervical constriction                                                                    | DD-I: Clinically normal crown morphology<br>DD-II- Bulbous Crowns                  |
| <b>Root Morphology</b>                   | Short, thin, blunted                                                                                         | Extremely short or absent roots; DD-II: normal roots but abnormal pulp chambers    |
| <b>Wear:</b>                             | Generalized severe wear patterns due to weakened anatomical structural integrity                             | Primary teeth: Severe<br>Permanent: Less Severe                                    |
| <b>Bonding:</b>                          | Enamel : +<br>Dentin: -                                                                                      | Enamel: +<br>Dentin: -                                                             |
| <b>Fixed Prosthodontic Treatment</b>     | A) Complete Coverage: +<br>B) Veneer or Bonded Restoration: -                                                | A) Complete Coverage: + (DD II)<br>B) Veneer or Bonded Restoration: -              |
| <b>Removable Prosthodontic Treatment</b> | Effective interim/definitive option when teeth are severely worn or lost; distributes forces favorably.      | DD-I: +<br>DD-II: +                                                                |
| <b>Implant Prosthodontic Treatment:</b>  | DI-I: -<br>DI-II/III: +                                                                                      | DD-I: +<br>DD-II: +                                                                |



**Figure Above:** Completion of restorative case of Dentinogenesis Imperfecta with Complete Coverage Maxillary Restorations and Implant Supported Fixed Complete denture in the Mandible.

## Decision Making Flowchart



## Conclusions

Prosthodontic management of DI and DD requires **early, individualized, and multidisciplinary** care. Treatment should consider age, growth, and functional needs, using restorations, removable prostheses, or implants according to age and restorative status. Regular reassessment and staged interventions ensure long-term function, esthetics, and occlusal stability, with success depending on early diagnosis, material choice, and interdisciplinary collaboration.

## References

