

CHAPTER 5

RAPID MAXILLARY EXPANSION (RME): CONCEPTS, EVIDENCE AND CONTEMPORARY PRACTICE

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INTRODUCTION

Rapid maxillary expansion (RME) is a cornerstone orthopedic procedure for correcting transverse maxillary deficiency in growing patients and, with skeletal anchorage or surgery, in older adolescents and adults. From Angell's 1860 description to contemporary toothborne, tooth-tissueborne, and boneborne devices, the central idea has remained consistent: controlled forces are applied to open the midpalatal suture and remodel circummaxillary articulations, widening the maxillary base with secondary dentoalveolar changes. Understanding suture maturation, age-related variability, and the distinction between orthopedic and dental effects is crucial for diagnosis, patient selection, and protocol design. Evidence shows that short-term changes include wedge-shaped opening of the mid-palatal suture and increased nasal cavity width; long-term vertical and anteroposterior effects are small. Stability depends on the proportion of skeletal versus dental change, high-quality intercuspation, and an appropriate retention strategy. In adults, miniscrew-assisted RME (MARPE) offers a nonsurgical option but carries device-related complications and a nonnegligible failure rate; surgically assisted RME (SARME) remains the standard when sutures are highly interdigitated.

HISTORY

The idea that maxillary width can be modified orthopedically predates modern imaging. In 1860 Emerson C. Angell reported widening a 14½-year-old's maxillary arch with a double jackscrew, noting midline diastema formation - evidence of sutural opening that would later be confirmed radiographically (1). Profession-

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