Tip-Edge Orthodontics has come about as a result of world-wide demand for a comprehensive textbook, outlining the use and possibilities of what is still a relatively new appliance system. It is remarkable that such a seemingly small modification to a single edgewise bracket should have such far reaching consequences and implications, overturning much established orthodontic thinking in the process. Inevitably, this means a reappraisal of the way we think, in our approach to our cases. Clearly there has been a long felt need for a definitive textbook, to stand alongside the many which have been written on edgewise and straight wire techniques, for which there is certainly no lack of guidance.

This book is therefore additional to the Tip-Edge Guide, which serves as a useful handbook, by way of introduction, coming from the birthplace of the Tip-Edge appliance and former Begg centre of excellence. It will be noted that Tip-Edge Orthodontics approaches Tip-Edge from a straight wire perspective, as has been long requested by those many orthodontists around the world who have participated on courses. In so doing, it fulfils my number one professional ambition, based on extensive clinical experience of Begg and straight wire techniques, by combining the very best of both worlds: the ease of differential tooth movement, with the finishing precision of a preadjusted appliance. Tip-Edge is the only bracket able to achieve this within a single archwire slot.

Inevitably, such a demanding project is not as single handed as it may appear. At Clans Clwyd Hospital, I would like to acknowledge Dr David Harrison, who finally persuaded me to write the book, also Dr Joy Hickman and Dr Annabel Teague, for their proofreading and encouragement.

Pam Sheridan is surely an assistant without peer (confirmed by the many overseas visitors who have watched her at work) who has sat patiently at my side right through the years of discovery with Tip-Edge. The work of Ann Sim, hygienist, speaks for itself within these pages.

As a source of inspiration I must first mention Dr Peter Kesling, not least because he invented the bracket, and indeed his co-workers at the Kesling Rocke Orthodontic Center. These include his son Dr Chris Kesling and the late and much missed Dr Tom Rocke. It is a privilege to be able to swap ideas across the Atlantic with progressive minds, watching our baby grow and learn new tricks! Thanks are also due to TP Orthodontics Inc. for their help in providing exclusive data for the illustrations.

No book can be better than its publisher. At the outset, thank you Bill (Dr William Clark of Twin Block fame) for suggesting me to Mosby just as, unknown to you, I was about to start tapping keys, and later to Dr Colin Twelftree, for those constructive suggestions at proof stage. The energetic Michael Parkinson, as Commissioning Editor, guided me through the maze of first time authorship, while Lynn Watt, Project Development Manager, has miraculously assembled together all the pieces of a highly complex jigsaw. And not forgetting Robert Britton, artist extraordinary, who has consistently managed silk purse illustrations from my sow’s ear sketches.

Closer to home, my son Paul, the engineer of the family, spent a vacation in the attic delivering the mathematical secrets locked up inside the Tip-Edge bracket, thereby greatly clarifying our understanding of what is going on in Rectangular Stage III. Lastly, and far from least, the most fortunate of authors have patient wives behind them. Rachel has been one of these, having lost me for countless hours to the computer.

I can only trust that the result will justify the efforts of many.

Richard Parkhouse
# Contents

Preface vi  
Acknowledgements vi  

1. Introduction 3  
2. Differential tooth movement 9  
3. Dynamics of Tip-Edge 15  
4. Auxiliaries 23  
5. Treatment stages 31  
   Case 1 32  
6. Bonding and setting up 39  
7. Stage I 45  
   Case 2 49  
   Case 3 53  
8. Setting up Stage I 59  
9. Stage I Checks 71  
10. Power tipping 75  
   Case 4 78  
11. Stage II 85  
   Case 5 91  
   Case 6 95  
12. Setting up Stage II 103  
13. Stage II Checks 109  
   Case 7 110  
   Case 8 115  
14. Stage III 121  
   Case 9 127  
15. Stage III Archwires 133  
16. Stage III Setting the torque 137  
17. Stage III Fitting the archwires 145  
18. Stage III Checks 151  
   Case 10 155  
   Case 11 160  
19. Precision finishing 167  
20. The non-compliant patient 173  
Postscript 177  
Treatment sequence 179  
Further reading 180  
Index 181
CHAPTER 1

Introduction

Historical perspective

Overcoming the limitations of conventional brackets

Historical perspective

Recognition is rightly given to Dr Edward Angle as the father of fixed appliance orthodontics (Fig. 1.1). The "Edgewise" bracket, which he invented as long ago as 1925, has been the cornerstone of fixed appliance practice ever since. It provides the natural way of obtaining multidimensional root control and has, in no small way, elevated orthodontics to a new level. Many of the intrinsic traits and limitations of earlier appliance systems have since been acknowledged, but more importantly, overcome.

It is little known that Angle himself appreciated that tooth movement is facilitated by allowing a tooth to slide. However, his edgewise bracket, illustrated in Fig. 1.1, is a simple prong device for moving a tooth into an extraction space generated by a threaded arch. The archwire to the root incorporated a pronged wheel to allow gradual expansion of the occlusal space. Unfortunately, he had no means of subsequent tooth movement. Importantly, after he conceived the edgewise bracket, he adopted his well known non-extraction treatment doctrine, in which his edgewise bracket was best applied, although many of his results, as those shown, proved to be impossible.

While several orthodontists of the period period attempted to improve Angle's concept, such as Heinz, Zirkle, and Burgener, several discovered that immediate, in search of virtual stability, Dr. Ing. F. H. P. Fig. 1.1. Dr. Edward Angle.

Fig. 1.1. Dr. Edward Angle.
CHAPTER 1

Introduction

The Tip-Edge® (TP Orthodontics Inc., La Porte, Indiana, USA) bracket was invented by Dr Peter Kesling to introduce differential tooth movement within an edgewise based bracket system. As its name suggests, Tip-Edge combines an initial degree of tooth tipping, which greatly facilitates tooth movement, prior to 'edgewise' precision finishing.

Based on extensive clinical experience, it is the belief of the author that Tip-Edge is the most significant innovation in fixed appliance orthodontics since the original edgewise bracket. While essentially a 'straight-wire' appliance itself, in terms of preadjusted bracket specification and elimination of looped archwires and finishing bends, it overcomes the fundamental limitations of today's popularly accepted straight-wire systems, and opens up new horizons in fixed appliance orthodontics.

Although the title of Tip-Edge was originally coined as a nickname, it has since become adopted worldwide, in preference to the official and more formal title of Differential Straight-Arch® (TP Orthodontics Inc., La Porte, Indiana, USA) technique.

Historical perspective

Recognition is rightly given to Dr Edward Angle as the father of fixed appliance orthodontics (Fig. 1.1). The 'Edgewise' bracket, which he invented as long ago as 1925, has been the mainstay of fixed appliance practice ever since. It provides the easiest way of achieving three-dimensional root control and was, in its day, years ahead of its time. Time moves on, however, and many of the intrinsic faults and limitations of edgewise based systems have since been acknowledged, but incompletely addressed.

It is little known that Angle himself appreciated that tooth movement was facilitated by allowing a tooth to tip. Previous to his edgewise bracket, he illustrated a crude piston device for retracting a canine into an extraction space, propelled by a threaded screw. The attachment to the band incorporated a primitive hinge to allow distal crown tipping of the tooth being moved. Unfortunately, he had no means of subsequent root uprighting. Significantly, shortly after he conceived the edgewise bracket, he adopted his well known non-extraction treatment doctrine, to which his edgewise bracket was best suited, although many of his results, as history shows, proved to be unstable.

While several orthodontists of the postwar period reintroduced the concept of extractions, in crowded or severe discrepancy cases, in search of greater stability, Dr Raymond Begg (Fig. 1.2) was notable in evolving a different bracket system. The resulting Begg technique marked a radical departure from conventional treatment mechanics. In fact, the Begg bracket was itself a modification of Angle's earlier 'ribbon arch' bracket. Its adoption was designed to overcome one of the prime disadvantages inherent in all edgewise systems, which Begg had previously recognized. This is that every tooth is subject to mesio-distal bodily control from the moment of archwire engagement, thus increasing resistance to retraction. By allowing teeth to tip freely during the initial stages of tooth translation, Begg introduced an entirely new sequence of tooth movement, first tipping the crowns into