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‘Orthodontic Retention and the role of the general dental practitioner’

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Key points:

- Outlines why long-term orthodontic retention is needed for stability of tooth positions after orthodontic treatment.
- Highlights the importance of the general dental practitioner’s role in long term orthodontic retention and the need for good communication between orthodontists and general dental practitioners
- Suggests how communication between orthodontists and general dental practitioners might be improved

Abstract

Introduction: Long term orthodontic retention using removable or fixed retainers is needed to maintain the outcome of orthodontic treatment. The aim of this article is to describe how long-term retention is managed and to report on a survey of general dental practitioners (GDPs) as to how this management currently operates in the UK

Materials and methods: GDPs were invited to complete a short online survey on orthodontic retention using an open notice posted in the British Dental Journal and a direct e-mail to the members of a local dental clinical society

Results: Fifty GDPs completed the online survey. Overall, the findings highlighted poor levels of communication between orthodontists and GDPs with respect to the latter assuming responsibility for the management of long-term retention.

Conclusion: The management of long-term retention could be improved by more effective communication between the orthodontist and GDP. One solution might be a retention management proforma. GDPs are in some instances willing to undertake more of the management of retention following further training and possible remuneration.

Introduction

Following correction of a malocclusion there is a risk of change in tooth position, either because unstable tooth movements have been undertaken as part of orthodontic treatment, or due to other uncontrollable factors such as facial growth. Continued facial growth is part of the normal ageing process [1,2] and is known to occur well into middle age.[3] It is therefore now broadly accepted that most patients require long term retention to maintain the alignment of the teeth and by implication to remain satisfied with their final orthodontic result.

There is disagreement concerning the risks of relapse and the threshold at which it becomes of concern. If any degree of relapse is unacceptable, this would place particular onus on prevention. These issues have implications for the management of orthodontic retention in both the short and the long term, and for whoever is managing it, be it the orthodontist or the general dental practitioner.

While the benefits of retention in maintaining antero-posterior and vertical correction are less clear-cut, with respect to the development of lower anterior malalignment the number of years without a retainer has been found to be a strong predictor of post-treatment change,[4] with a reported Odds Ratio (OR) of 1.32 (95% CI 1.03 to 1.68). The presence of a bonded retainer is also a strong predictor of stability (OR: 0.31; 95% CI 0.10 to 0.98). As such, the need for retention in order to maintain alignment is apparent, although there has been less research concerning the impact of relapse on patient satisfaction.

The perceptions of change and degrees of acceptability and possible need for retreatment among lay people, have increasingly been sought. Alqahtani et al. (2012)[5] reviewed lower incisor irregularity and unsurprisingly, orthodontists were found to have a lower tolerance

for lower incisor malalignment than lay persons. Interestingly, within the latter group, the threshold for treatment was lower in those who had previously undergone orthodontic treatment when compared to those who had not. A similar, though less convincing trend was also seen in a follow-up study focusing on upper incisal irregularity.[6]

Chow et al. (2020)[7] investigated factors that may have led to relapse in patients who were seeking retreatment, comparing the original malocclusion to their relapsed state. The factors that were thought to contribute to relapse once again included poor original treatment, maturational changes, unfavourable growth and inadequate retention. The primary driver in seeking retreatment was aesthetics. Patients who have previously undergone treatment not only appeared to notice malalignment more than untreated lay persons, but may also present for retreatment with a less severe malocclusion.

The choice of retainer is often based on the personal preferences and the experience of the treating orthodontist.[8] Factors that can influence the choice of retainer include the pre-treatment tooth positions such as multiple tooth rotations, a median diastema, the depth of the initial overbite, the degree of interdigitation post-treatment, periodontal status and oral hygiene.[9] However, the scientific evidence concerning the best type of retainer is equivocal, at least in the short-term.[10]

Irrespective of retainer type, it is important that wear is monitored over the long-term. It has been suggested the treating orthodontist should monitor retainer wear for the first 2 years after placement, particularly in the case of bonded fixed retainers. This is because most bond failures with these types of retainers occurs within 2 years of placement. [11]

Within the publicly funded National Health Service (NHS) there is a requirement for supervision of orthodontic retention by the treating orthodontist for a minimum 12-month

period following completion of active treatment (NHS BSA 2005). [12] Although a minimum 12-month period is the requirement, in all likelihood it is unlikely to extend beyond this, as no further payments are made after this time period. Whether retention is supervised by the orthodontist for 12 or indeed for 24 months following active treatment, there will come a point when the patient is most likely going to be discharged by the orthodontist, back to the care of the GDP. This relates to capacity issues, meaning that orthodontists are typically unable to review retention indefinitely.[9] While the possibility of remote monitoring of orthodontic retention is becoming more established [13,14], the expectation may also be for the patient to monitor their own tooth alignment and retainers. This prospect is perhaps somewhat daunting, with a lack of follow-up appointments linked to independent decisions to continue or cease retainer wear. Alternatively, the orthodontist may expect the GDP to monitor the occlusion and retainers during routine general dental check-ups. However, if the expectation is for annual retainer checks in conjunction with the patient's recommended general dental recalls, it begs a series of questions, including:

- Are GDPs happy to participate in supervising orthodontic retention?
- Are they formally asked to supervise the orthodontic retention of their patients by the orthodontist?
- Does the orthodontist provide guidance in the form of a protocol for retention?
- Should patients bring their removable retainers to be checked by their general dental practitioner?
- Do GDPs enquire about/inspect the retainers of patients at their routine general dental check-ups?

- What would a GDP supervising orthodontic retention be happy to do? For example, would they be comfortable repairing or replacing a fixed or removable retainer?

Indeed the need for clarity concerning the responsibility of monitoring of long-term retention has been previously suggested [16], along with other considerations such as the orthodontic records being made available to the GDP when any transfer of care is made, together with the provision of appropriate training. Similarly, Littlewood (2017) [17] suggested appropriate remuneration and training for general dental practitioners taking over the responsibility for long term orthodontic retention. Specifically, training on detection of failing bonded retainers, along with their repair and replacement, the ability to monitor the fit of removable retainers, to motivate patients to wear and look after their retainers, to monitor the effect of retainers on oral health and the ability to make any necessary adjustments were advocated. A short on-line survey of general dental practitioners aiming to explore their perception of roles and responsibilities regarding the monitoring of orthodontic retention was therefore undertaken.

Materials and Methods

This was a cross-sectional study which utilised a short 20 question, on-line questionnaire (Appendix 1). Ethical Committee approval to run the questionnaire was granted by the University of Bristol Faculty Ethics Committee (ref: 106204). In order to recruit general dental practitioners to determine their views on orthodontic retention, a notice was published in the July 2020 issue of the British Dental Journal, along with an e-mail sent to the members of the dental section of the Clinical Society of Bath. The questionnaire remained open until the 31st August 2020.

The questionnaire was developed and piloted on ten UK-based GDPs for understanding, interpretation and time taken to complete. Feedback resulted in adjustments to the wording and a completion time of less than five minutes. These responses were not included in the final analysis. The survey was administered and results collected using Bristol Online Surveys.

Results

A total of just 56 responses were received for the questionnaire of which 50 were from GDPs. Of the GDPs, 72% held a NHS general dental practice contract and 10% also an NHS orthodontic contract.

In response to the question "Do you receive correspondence from the orthodontist requesting that you now monitor the orthodontic retainers at the end of treatment?" only 6% said 'Always' with 44% 'Never' receiving this. Other responses were: Most of the time 10%, Sometimes 24% and Hardly ever 8%. When asked the same question, but this time whether the correspondence gives any specific information/guidance such as 'please monitor retainers annually' or 'please refer back if there are any problems'?, the responses were similar with 0% Always and 62% Never. The other responses were: Most of the time 8%, Sometimes 22% and Hardly ever 8%

When asked whether or not they routinely asked about and/or inspected patients' retainers at their routine general dental appointments, 18% stated Always, 28% Mostly, 34% Sometimes, 12% Hardly ever and 8% Never. When also asked whether they recorded this within the patient clinical record 10% didn't answer, 8% responded Never and only 26% said Always. The other responses were Mostly 10%, Sometimes 20% and Hardly Ever 18%.

The next question enquired whether patients brought their retainers to their general dental appointments. 24% responded Never, 48% Hardly Ever, 24% Sometimes and 4% Mostly. When asked what they do if a patient presents with a fractured removable retainer, 62% would replace/ repair with a private fee, 8% would replace with an NHS charge, 24% would refer to an orthodontist and 8% stated Other, and in the free text box the additional responses included replace free of charge or with a private fee. Similarly, if the retainer was lost 60% would replace the retainer with a private fee charged, 20% would refer back to the orthodontist and 10% replace with an NHS charge. 10% replied Other and in the free text box the answers were similar to those for a fractured removable appliance.

The next series of questions concerned bonded retainers. The first question asked the GDPs what they would do in the case of a bonded retainer that had just detached from one or more teeth, but the retainer was intact, the teeth were still well aligned and the retainer could be repaired? 38% said they would repair and levy a private charge, 30% they would repair it under the NHS, 24% said they would refer back to the orthodontist and again 8% replied Other and used the free text box. Here some said they would levy a minimal private fee if the patient/ guardian wanted it repaired. The second fixed retainer question asked what the GDP would do if the bonded retainer had fractured and required replacement, but the teeth were still well aligned. 58% said they would refer to the orthodontist, 16% said they would remove residual adhesive and replace it with a bonded retainer under private contract and 4% under NHS contract. 10% and 6% said they would remove residual adhesive and replace the bonded with a removable retainer under private and NHS contract respectively. When asked if they would be comfortable fitting a bonded retainer 60% said they would. When asked about when a bonded retainer is to be fitted at completion of orthodontic treatment if they would prefer the orthodontist to fit it or whether they would

be happy to do so themselves, 72% felt the orthodontist should fit it, but 16% said they would be happy if they could receive training and remuneration, and 12% said they would be happy to do so without further training, but would wish to be remunerated.

Discussion

Orthodontic retention invariably entails a lifelong commitment for the patient, but most orthodontists are only likely to monitor retention for 12 to 24 months post treatment and therefore will often assume the patient's GDP will be happy to monitor retention and any ensuing dental change in the longer term. Good communication between the orthodontist and GDP is therefore essential, so that at the very least both are fully aware when any shift in the responsibility towards retention is to take place and what might be required.

The importance of this communication has been highlighted in a previous audit of practitioners' knowledge of orthodontic retention. [18] It was therefore disappointing to see that some 5 years later, as many as 44% of the respondents reported not receiving correspondence from the orthodontist requesting monitoring of the orthodontic retainers following discharge. It is accepted that effective two-way communication between two interdependent parties, namely primary and secondary care clinicians, is essential for the effective management of shared patients.[19] This interdependence is present because the primary care providers refer suitable patients for treatment and secondary care providers often require the primary care provider to undertake routine maintenance and perhaps some of the treatment, which in the case of orthodontics would include supervision of retention. Previous work has often focussed on the communication from primary to secondary care services, rather than in the other direction, highlighting some inadequacies [20,21] and how this might be addressed using a referral proforma. [22] There are few studies

investigating the standard of communication from secondary to primary care. However, it is understood that one of the pieces of information most valued by GDPs is the treatment plan sent by the secondary care provider. [23] A survey of Swiss orthodontists found that 93% would welcome the development of retention guidelines to assist their own orthodontic practice, and it would therefore seem sensible that similar guidelines, written as a proforma, could usefully be provided by orthodontists to GDPs when they are asked to assume responsibility for the monitoring of long-term orthodontic retention. [24]

Despite this lack of communication, most GDPs do appear to monitor the orthodontic retention of their patients, although most patients either never (24%) or hardly ever (48%) bring their removable retainers to their routine dental appointments. It was also of some concern from a medico-legal perspective that this monitoring of retention is not always recorded in the patient record.

In the case of fractured removable retainers, most GDPs appear to be happy to replace them either free of charge or for a private fee, and less often refer them back to the orthodontist. The same is true for detached bonded retainers, whereas in the case of a bonded retainer with a fractured wire the largest percentage would refer back to the orthodontist. In the case of a complete bonded retainer placement at the end of orthodontic treatment, although most GDPs were happy to fit one, they felt in most cases it should be fitted by the orthodontist. A small percentage felt they would require additional training and remuneration for carrying out this procedure, a point that has been made previously. [17] Moreover, the desire for further training, concerning both placement of fixed retainers and management of orthodontic emergencies, has also been highlighted previously. [18,25]

Although research has shown that GDPs are able to detect features of relapse, such as the horizontal movement of incisors, more efficiently than both untreated and past orthodontic patients [5] , the current questionnaire did not explore whether or not GDPs would be comfortable, or able to monitor other aspects of the post treatment occlusion, such as buccal segment relationships, overjet and overbite. For this they may also require additional training and would certainly require access to the original pre- and post-treatment orthodontic records. The latter should now be possible with the increasing availability of electronic records, although this places an onus on provision of access, as well as possible storage of electronic records in the longer term.

Patients take much of the responsibility for retention, being expected to wear their retainers as instructed, maintain them, and perhaps to some extent even monitor their own occlusion. Publicity campaigns to raise awareness of the need for prolonged retention have shown promise at least in the short-term. [26] Any longer-term benefits may well depend on improved co-operation between orthodontists, GDPs and patients. Previous work investigating patient satisfaction with orthodontic treatment outcomes has shown that most patients feel responsible for maintaining the alignment of their own teeth and are satisfied with their outcome. Conversely, patients who were likely to be dissatisfied with the orthodontic outcome may be more likely to delegate responsibility for their retention. The satisfaction with the type of retainer provided also has an impact on wear, with patients who had been prescribed clear retainers being very satisfied and therefore most likely to adhere to wear protocols. [27] There will inevitably be some patients who will consider retention the sole responsibility of the orthodontist or general dental practitioner, perceiving retention as otherwise onerous and expensive, rather than an investment in maintaining their corrected occlusion.[28] These patients are less likely to comply with the

prescribed retention regimen and may require the most monitoring over the longer-term, initially by the orthodontist and thereafter by the GDP.

A limitation of the current survey of GDPs is that it was a relatively small sample. This was attributed to the long delay in obtaining Ethical Committee approval at the time of the Covid-19 pandemic, compounded by the need for completion of the survey just as dental practices were resuming patient treatment following lockdown. Nevertheless, the results were informative and the trends generally clear. Moreover, the findings do appear to mirror those from previous much larger national and international surveys, indicating that improved communication is required between orthodontists and GDPs in order to provide cohesive orthodontic care. [18,24]

Conclusions

There are usually three parties involved in the management of long-term retention, namely the orthodontist, the patient and the GDP. Typically, the patient and the GDP bear the most significant long-term commitment, something which is usually taken as read by the orthodontist. However, communication from the orthodontist to the GDP, including any guidance on how to manage retention, is often lacking. Despite this, many GDPs do appear happy to repair or replace retainers as required. However, it is clear that communication needs to improve. Just as many orthodontists are now keen for orthodontic referrals to be made on a proforma to ensure appropriate information is provided to them to aid diagnosis, perhaps consideration should be given to routine adoption of a similar proforma following orthodontic treatment to guide GDPs on bespoke monitoring of retention. More research on GDP opinions concerning this and other aspects of the management of orthodontic retention would be worthwhile.

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Appendix 1

The online questionnaire.

About yourself:

1. I consent to participate in this study *Yes/No*
2. Are you a general dental practitioner mainly working in general dental practice? *Yes/No*
3. Do you deliver/hold a NHS general dental contact? *Yes/No*
4. Do you deliver/hold a NHS orthodontic contract? *Yes/No*

For your patients who have recently completed a course of orthodontic treatment and have been discharged by an Orthodontist (specialist practice or hospital):

5. Do you receive correspondence from the orthodontist requesting that you now monitor the orthodontic retainers? – *Always; Most of the time; Sometimes; Hardly ever; Never*
6. Does the correspondence give any specific information/ guidance such as 'please monitor retainers annually' or 'please refer back if there are any problems'? – *Always; Most of the time; Sometimes; Hardly ever; Never*
7. If the correspondence does give any specific information/guidance, please specify.

Regarding the monitoring of orthodontic retainers in general dental practice:

8. Do you routinely enquire about/inspect the retainers of your patients at their routine general dental check-ups? – *Always; Most of the time; Sometimes; Hardly ever; Never*

9. If you do enquire/inspect the retainers at their routine check-ups, do you record your findings in their clinical record? – *Always, Most of the time; Sometimes Hardly ever; Never*
10. Do your patients tend to bring their removable retainers to you to be reviewed at their routine general dental check-ups? – *Always; Most of the time; Sometimes, Hardly ever; Never*

When a patient presents at your general dental practice with a problem with their retainers:

11. What would you do if the patient has fractured their removable retainer? - *Repair/replace with NHS charge; Repair/replace with private charge; Refer to an orthodontist; Other*
12. If you selected Other, please specify
13. What would you do if the patient has lost their removable retainer? - *Replace with NHS charge, Replace with private charge; Refer to an orthodontist; Other*
14. If you selected Other, please specify
15. What would you do if a bonded retainer has just detached from one or more teeth, but the retainer is intact, the teeth remain well aligned and the retainer could be repaired? - *Replace with NHS charge; Replace with private charge; Refer to an orthodontist; Other*
16. If you selected Other, please specify
17. What would you do if a bonded retainer has fractured and needs replacing and the teeth remain well aligned?

    Replace with NHS charge; Replace with private charge; Remove residual bonded retainer and provide removable retainer with NHS charge; Remove residual bonded

retainer and provide removable retainer with private charge; Refer to an orthodontist; Other

18. If you selected Other, please specify
19. Would you feel comfortable fitting a lingual bonded retainer to well aligned teeth? Yes/ No
20. Would you prefer to fit prescribed bonded retainers yourself at the end of the course of orthodontic treatment provided by the orthodontist? - Yes and I would not need training to do this but would require remuneration; Yes if there was appropriate training and remuneration; No the orthodontist should do this