

The Acquired Anterior Open Bite: A Case Series

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Abstract

An anterior open bite (AOB) is present when there is no vertical overlap between the upper and lower incisors. Development of an AOB is most commonly observed during childhood, with a reported incidence of 2-4%, reducing until the early teens.¹ In children and adolescents, an AOB may develop due to the underlying skeletal and mandibular growth patterns or due to habits such as digit sucking or tongue thrusting.¹ AOB may also be associated with conditions such as muscular dystrophy² and amelogenesis imperfecta.³ However, adults may present complaining of a newly developed AOB, and the cause may not be immediately apparent.

An AOB may develop secondary to bony changes in the jaws e.g. orthodontic relapse, condylar resorption or endocrine disturbance (e.g. acromegaly); or in the teeth e.g. due to differential overeruption of posterior teeth.

In the absence of functional or aesthetic concerns, active management may not be indicated beyond monitoring the condition. Restorative management strategies include restorative, orthodontic and surgical modes of treatment, and a multi-disciplinary approach may be required.

This poster will present a series of adult cases where an AOB has recently developed. Potential aetiological factors and restorative management strategies will be discussed. Examples of restorative management are included via planning and execution of occlusal adjustment and placement of restorations.

Introduction

Whilst development of an AOB usually occurs in childhood and adolescence, adults may present complaining of a newly developed AOB. Patients who develop an AOB may describe newly developed functional difficulties associated with the inability to bring the anterior teeth into contact e.g. no longer able to bite sellotape. Figure 1 shows a 50 year-old electrician, who reported that he was no longer able to strip wires with his anterior teeth. In such cases, wear facets may be present on the incisors or canines, providing convincing evidence that tooth-to-tooth contact was once possible. Patients may attribute the alteration in incisal relationship to a particular event e.g. extraction of a tooth, dental restorations. Patients may also describe aesthetic concerns, or indeed may not have noticed the change in their occlusion: this may be noticed first by their dentist.

In some cases, the aetiology of recently developed AOB appears uncertain. The authors have seen a number of adult patients in whom an AOB appears to have recently developed. In some cases, no aetiological factor is immediately apparent.

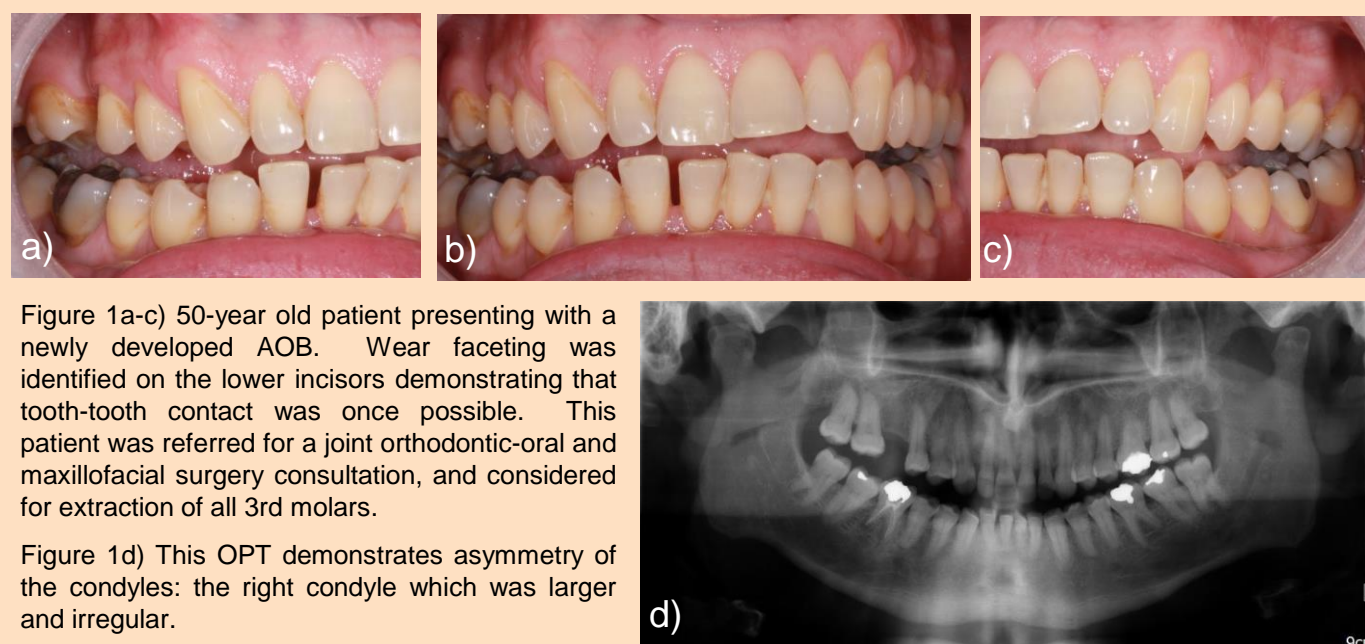


Figure 1a-c) 50-year old patient presenting with a newly developed AOB. Wear faceting was identified on the lower incisors demonstrating that tooth-tooth contact was once possible. This patient was referred for a joint orthodontic-oral and maxillofacial surgery consultation, and considered for extraction of all 3rd molars.

Figure 1d) This OPT demonstrates asymmetry of the condyles: the right condyle which was larger and irregular.

Possible aetiological factors of an acquired AOB

The occlusion is determined by the so-called posterior and anterior determinants: i.e. the temporomandibular joints (TMJs) and the teeth. Development of an AOB may therefore be due to changes in one or both of these determinants.

Changes to the teeth

- Differential overeruption e.g. partial coverage splints
- Occlusal changes due to restoration placement or extraction
- Extrusion due to periapical infection

Changes to the TMJs

- Trauma e.g. condylar/mandibular #
- Orthodontic relapse (occurs in around 40% of corrected AOB cases⁴) or adverse late growth
- Endocrine disorders e.g. acromegaly
- Condylar resorption, which may be idiopathic, secondary to orthognathic surgery, degenerative disorders or disk displacement disorders

Management Strategies

Radiographic examination is prudent in order to exclude fracture or pathology of the condyles e.g. hyperplasia, neoplasm, significant condylar resorption. If there is doubt as to this, referral would be indicated to an Oral and Maxillofacial Department. Where there is any concern as to the presence of an underlying systemic condition e.g. acromegaly, referral to the patient's GMP is warranted for further assessment.

Photographs and articulated study models provide a means of monitoring the condition.

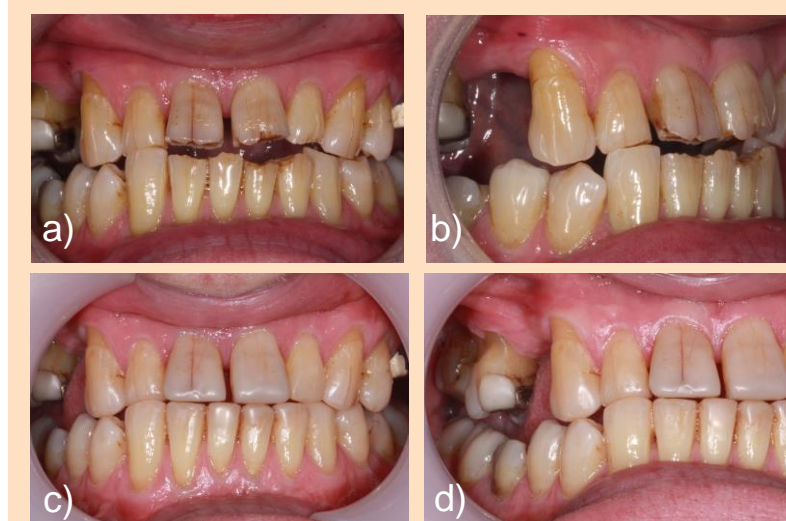
Strategies include acceptance (Figure 2), occlusal adjustment (Figure 3) and direct or indirect restorations (Figures 4, 5). Extraction of teeth could be considered (Figure 1). All of these treatments should first be planned and carried out on articulated study models. Management of any underlying TMD is advised prior to making any irreversible changes to the patient's occlusion, due to the risk of exacerbating muscular symptoms (Figure 6).



Figure 2a-c) 40-year old patient presenting with a new AOB. Wear faceting was identified along the incisal edges confirming a new AOB. Given this was mild and the patient had no concerns or functional difficulties, monitoring with study models and photographs was advised. The patient had a skeletal Class III relationship; it may be that adverse late growth led to the AOB development.

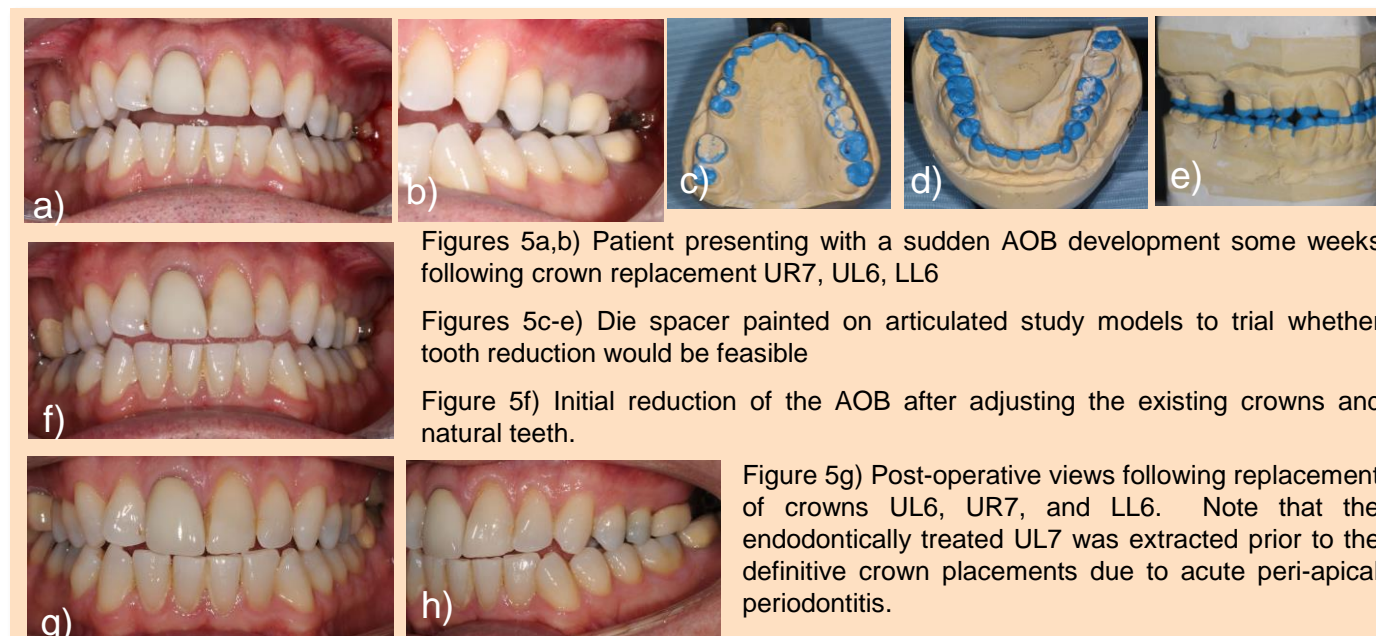


Figures 3d-f) Selective occlusal adjustment increased the overbite and achieved more posterior contacts. The patient is currently being monitored for further changes and is satisfied with the current occlusal relationship. After a period of monitoring and preventative advice regarding the non-carious tooth surface loss, direct composite restorations are planned to restore selective posterior teeth, which will in turn create further posterior occluding units.



Figures 4a,b) 63 year old patient presenting with a new AOB. Wear facets were present on the anterior teeth which no longer contacted. No abnormalities of the condyles were observed, and acromegaly was excluded following testing arranged through the patient's general medical practitioner. Selective adjustments were made initially to gain contacts on the UR2-LR3 and LL3-UL3. These were trialed on articulated study models to assess what was achievable.

Figures 4c,d) Direct composite restorations were placed based on a diagnostic wax up to provide even occlusal contacts LR4-LL5.



Figures 5a,b) Patient presenting with a sudden AOB development some weeks following crown replacement UR7, UL6, LL6

Figures 5c-e) Die spacer painted on articulated study models to trial whether tooth reduction would be feasible

Figure 5f) Initial reduction of the AOB after adjusting the existing crowns and natural teeth.

Figure 5g) Post-operative views following replacement of crowns UL6, UR7, and LL6. Note that the endodontically treated UL7 was extracted prior to the definitive crown placements due to acute peri-apical periodontitis.



Figures 6a-c) This 33 year-old patient presented with symptoms of TMD including painful joints, particularly in the morning, and multiple fractured restorations. There were no joint noises or trismus. There was a 4-year history of an AOB. Initial treatment included articulated study models and provision of a stabilisation splint. Following successful management of the TMD symptoms, selective occlusal adjustment and/or placement of restorations could be carried out following trial and planning on study models.

Conclusions

The development of an AOB in adulthood may present challenges to the dental practitioner in terms of diagnosis and management. The presence of underlying systemic disorders should be excluded, with consideration given to onward referral for medical assessment. Referral must also be considered where condylar neoplasm is suspected following radiographic examination.

The aetiology for the AOB may not be obvious, or indeed possible to determine; but following exclusion of underlying pathologies, changes in the condyles may be the most likely causative factor. Management strategies have been described which may include acceptance, occlusal adjustment, restoration or extraction of teeth. Multi-disciplinary care may be warranted in conjunction with orthodontics or oral and maxillofacial surgery.

Acknowledgements: Dr KA Durey, Dr A Jowett Dr M Kellett, Mr P Nixon

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