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Case Report

Progressive facial asymmetry resulting from condylar osteochondroma – A case report detailing the resection, subsequent orthognathic intervention and custom joint replacement

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ABSTRACT

We discuss a 37 year old male – who presented with marked facial asymmetry and signs/symptoms suggestive of condylar hyperplasia. Imaging confirmed a large exophytic growth arising from the right mandibular condylar head. Treatment included tumour resection, orthognathic intervention and total joint replacement. The clinical presentation, pathology and treatment, along with a brief discussion are described in this report.

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1. Introduction

Osteochondroma is a relatively uncommon benign neoplasm – sometimes described as a hamartomatous process – rarely affecting the mandibular condyle. The condition can present with signs and symptoms easily misinterpreted as condylar hyperplasia. This case illustrates the rarity of the disease

along with the available treatment options. The overall objective of this short report is to highlight the low incidence of condylar osteochondroma, whilst adding to the existing available literature on this condition. We are not aware of any recent articles specifically detailing a total condylectomy, with unilateral osteotomy and custom joint replacement. This is therefore a unique combination.

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2. Case report

A 37 year old male presented in 2010 with a history of progressing facial asymmetry. The patient had become gradually aware of this following surgical removal of his lower right third molar (10 years previously). Due to a period of poor dental attendance the progression was undiagnosed until 2010 when the patient was referred for 'occlusal management'. On presentation the patient had marked facial asymmetry with Class III skeletal and incisor relationship and centreline/chin point shift to the left (Fig. 1). An orthopantomograph (Fig. 2) displayed an increase in condylar height on the right and a provisional diagnosis of right condylar hyperplasia was initially made. However, on closer examination, a radiopaque mass was noted at the right condylar head.

The patient's case was discussed at a multidisciplinary meeting and a bone trephine biopsy arranged. Two bone specimens were obtained from the right condylar head on 5th January 2011 with the pathology report concluding – 'Possible Condylar Hyperplasia'.

Approximately one year after initial presentation the patient had a right sided condylar resection (Fig. 3) (osteotomised at sigmoid notch) via a hemi coronal flap. Post operatively the patient developed weakness of the facial nerve, specifically the zygomatic and temporal branches which resulted in a right sided brow ptosis. As the bone remodelled he subsequently developed a left posterior and anterior open bite (Fig. 4). Due to this persistent malocclusion the patient was

Fig. 1 – Cropped clinical photograph highlighting marked facial asymmetry with chin point shift and resultant malocclusion.

Fig. 2 – Orthopantomograph outlining radiopaque mass at right condyle with associated malocclusion.

assessed on a Joint orthognathic planning clinic. A treatment plan was devised which involved pre-surgical orthodontics to level, align and coordinate the dental arches.

Surgical management involved placement of a custom made joint using the Biomet Microfixation Total Joint Replacement System (Fig. 5), combined with a unilateral left mandibular sagittal split osteotomy. A combination of the above resulted in correction of the chin point shift and malocclusion (Figs. 6–8).

3. Discussion

Osteochondroma is a condition defined as 'cartilage capped osseous projection protruding from surface of the affected bone'¹. The mass can be either sessile or pedunculated and is normally encompassed by 1–2 mm of hyaline cartilage.² The condition commonly affects long bones e.g. fibula and usually occurs in bones with endochondral ossification. It is a benign tumour and accounts for 8% of all bone tumours.

When associated with the mandibular condyle osteochondroma results in severe facial asymmetry, deranged occlusion, limitation of function/mouth opening and pain.³ The incidence of the disease (not specific to mandibular condyles) is reported to be 1%, but figures quoted range between 1 and 10%.⁴ Male and females are equally affected.⁵ A. Roychoudhury et al., states that a total of 90 cases of mandibular

Fig. 3 – Clinical photograph of resected condyle and associated osteochondroma. Approximate size: 35 mm.

Fig. 4 – Post condylectomy the patient developed anterior and ipsilateral (left) posterior open bite.

osteochondroma have been reported in English literature³ – highlighting the low incidence of the condition.

The aetiology is thought to be on the whole, unknown, but some studies suggest it can be associated with facial trauma, hormonal growth and familial/genetic factors.⁶ Osteochondroma is rare in the mandible due to the intramembraneous ossification in this bone – however there are studies that have reported it affecting the mandible, zygoma, skull base and maxillary antrum.⁶

There are various treatment options discussed within the literature. Firstly, surgical intervention must be considered specifically relating to total condylectomy versus conservative condylectomy⁷ – sometimes described as a ‘low condylectomy’. Consideration must be given to orthognathic surgery from the outset. Treatment can therefore be categorised into either a one-stage or two-stage procedure.⁸ Generally orthognathic input can be avoided if the occlusion post operatively is acceptable. Equally, orthodontic camouflage can be utilised e.g. genioplasty and ipsilateral inferior

Fig. 5 – CT image of patient during custom joint replacement planning – outlining custom prostheses design and resected right mandibular condyle.

Fig. 6 – CT image illustrating location of unilateral sagittal split osteotomy.

body ostectomy³ to solely improve facial symmetry and aesthetics. Specific to this case – after condylar resection – the patient developed further asymmetry with chin point shift – this therefore merited orthognathic input with fixed orthodontic appliances and a unilateral osteotomy.

Biomet stock TMJ replacement system has been in use since July 1995 with over 2500 being placed worldwide. Current focus is moving towards ‘patient matched implants’ for rare, complex cases. Current literature states that total joint replacement (TJR) should be postponed, if possible, until all joint components are deemed unsalvageable.⁹ That said, total joint replacement – with the Biomet system has reportedly good success. One study by E. Aagaard found only 2 joints requiring revision from a cohort of 61 patients undergoing TJR.⁹ It is suggested successful outcomes are related to the quality of pre-surgical planning. Planning is performed using a combination of CT scanning and MRI – allowing ‘patient specific positioning guides’ to be developed. Concurrent input from both the surgeon and technician is used via an interactive web-conference to ensure the final prostheses is of optimal standard/fit.

Both the fossa and mandibular components are constructed from different materials and milled in a 5-axis machine. The mandibular component consists of either: Cobalt–Chromium–Molybdenum Alloy or Titanium alloy (both coated with titanium alloy). The fossa component is constructed from ultra high molecular polyethylene.¹⁰

Fig. 7 – Post operative photo of occlusion – nearing completion of fixed orthodontic treatment.

Fig. 8 – Facial view post operatively demonstrating correction of chin point shift/facial asymmetry.

Delayed presentation of this patient was unusual but likely attributable to poor dental attendance and interestingly – the absence of pain from the region. Pain is generally quoted as a routine symptom in this condition – particularly when associated with the TMJ.¹¹

4. Conclusion

In summary, osteochondroma is a destructive condition rarely affecting the TMJ but easily mistaken for condylar

hyperplasia. Various treatment modalities exist with little research available on the effectiveness of each. The above, two-stage approach with custom Biomet prostheses, resulted in a clinically successful outcome. Further research in this field would be advisable.

Conflicts of interest

All authors have none to declare.

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