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Velopharyngeal insufficiency after maxillary advancement in patients with cleft palate – a survey of risk assessment in the United Kingdom and Ireland☆

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Abstract

Patients with cleft lip and palate may require orthognathic surgery to correct severe impairments in midfacial growth. Maxillary advancement in this group, however, is linked to deterioration in velopharyngeal function (VPF), and it is not clear how cleft teams assess this risk. We therefore surveyed surgeons from 15 cleft units who provide orthognathic treatment, to gain an understanding of current practice in the UK and Ireland. A total of 16/21 surgeons from 14/15 units responded. While 14/16 surgeons agreed that these patients are at risk of a deterioration in VPF after maxillary advancement, two disagreed. Preoperative assessment of perceptual speech is required in all cases, but only 9/14 routinely did an instrumental assessment of VPF. One third of respondents thought that they could not identify "borderline" cases. There were differences in how surgeons obtained preoperative consent regarding deterioration in VPF, and whether surgical plans should be modified accordingly. There was considerable variation in current practice regarding risk, assessment, and management of potential changes in VPF after orthognathic surgery. A national forum for multidisciplinary discussion would allow for the standardisation of care across the UK and Ireland. Further study is needed to establish the effects of orthognathic surgery on VPF in this group, as well as the clinical benefits of instrumental assessments.

Keywords: velopharyngeal function; cleft lip/palate; maxillary advancement

Introduction

Patients with cleft lip and palate may require orthognathic surgery to correct impairments in midfacial growth and improve function and aesthetics. The effects (if any) of maxillary advancement on velopharyngeal function (VPF) are, however, debatable Some studies have reported a risk of impairment,[1–4] which can lead to velopharyngeal insufficiency (VPI), but others, including a systematic review,[5] have reported that current evidence is inconclusive.[6–8]

Both the Royal College of Speech and Language Therapists (RCLST) and the American Cleft Palate/Craniofacial Association (ACPA) recommend the assessment of VPF, which should include instrumental measures, if VPI is suggested.[9,10] A report from the ACPA suggested that an instrumental assessment (such as videofluoroscopy or nasometry, but not radiography) should always be done to measure speech-related variables of surgery.[11] This, however was published in 1988.

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Table 1
Responses and comments from survey question regarding the risk of deterioration of velopharyngeal function after maxillary advancement in patients with cleft lip and palate.

Question	Agree	Disagree	Comments
Do you agree? Cleft palate patients, who have a maxillary advancement osteotomy, are at risk of deterioration of velopharyngeal function during speech.	13/15	2/15	". . .there is approximately a 30% chance of VP dysfunction post osteotomy." "Our evidence suggests this is a theoretical risk only. . ." "It is well established and broadly accepted that VPI is a risk following maxillary advancement surgery" "Whilst intuitively it seems likely that the risk of deterioration is high, it has been my experience that this may not be true."

Table 2
Results and comments for survey question regarding the preoperative consent of patients about the risk of deterioration in velopharyngeal (VP) function.

Question	Yes	No	Comments
When consenting patients preoperatively, do you provide different levels of risk based on preoperative VP assessment?	9/15	6/15	"Whilst it would be good to be able to differentiate the relative risks I don't feel that I am able to do so." "30% for adequate, more for inadequate." "10% risk, with 5% risk of need for surgical correction." "We warn of the theoretical risk but add that our experience suggests that in our hands this does not happen."

Several studies have attempted to identify predictors for the development of VPI after maxillary advancement – for example, length of the velum, or preoperative "borderline" function,[2,12–14] which require instrumental assessment such as videofluoroscopy.[12]

It is, however, unclear how cleft teams in the UK and Ireland assess this risk, and how often these methods are actually used. The aim of this study, therefore, was to find out about current practice so that we can facilitate the standardisation of care and implementation of future guidance if needed.

Method

We sent an online, 16-question survey (supplemental table) to 21 cleft surgeons who provide orthognathic surgery in 15 hospitals that treat patients with cleft lip and palate in the UK and Ireland. We asked them to involve the wider team, for example, speech and language therapists, as appropriate.

Results

Response rates

A total of 16/21 surgeons in 14/15 hospitals responded. Not all respondents completed all the questions so the responses for each one varied from 14 to 16.

Most respondents (12/16) did more than five osteotomies/year on patients with clefts; seven of them did more than 10 (supplemental table).

Risk of deterioration in VPF, and maxillary advancement

While 13/15 surgeons agreed that these patients are at risk of deterioration in VPF, two disagreed (both completed more than 10 osteotomies/year) (Table 1).

Modifying treatment because of risk of VPI

Two thirds of respondents (10/16) modified their surgical treatment plan to reduce the risk of deterioration in VPF, while the rest (6/16) did not. The most common modifications cited were bimaxillary surgery (maxillary advancement and compensatory mandibular setback) (10/16) and maxillary osseodistraction (8/16). All those who did fewer than five osteotomies/year (n=4) would consider modifying their treatment plan, while of those who did more than five (n=12), six would modify and six would not.

Consent and risk of VPI

When respondents were asked about the information they gave to patients about the risk of velopharyngeal deterioration (Table 2), six of 15 quoted the same level of risk regardless of the results of any preoperative assessments, and nine adjusted the level. One informed patients that it was only theoretical, and six thought that it was unpredictable so did not give a percentage. In most units (11/15), speech and language therapists helped to counsel patients.

Preoperative assessment of VPF

Preoperatively, all teams routinely (defined as "always", or "most of the time") did a speech assessment (Fig. 1). Eight respondents used lateral videofluoroscopy routinely to investigate velopharyngeal function, six did not use it routinely, and two teams never used it before maxillary advancement.

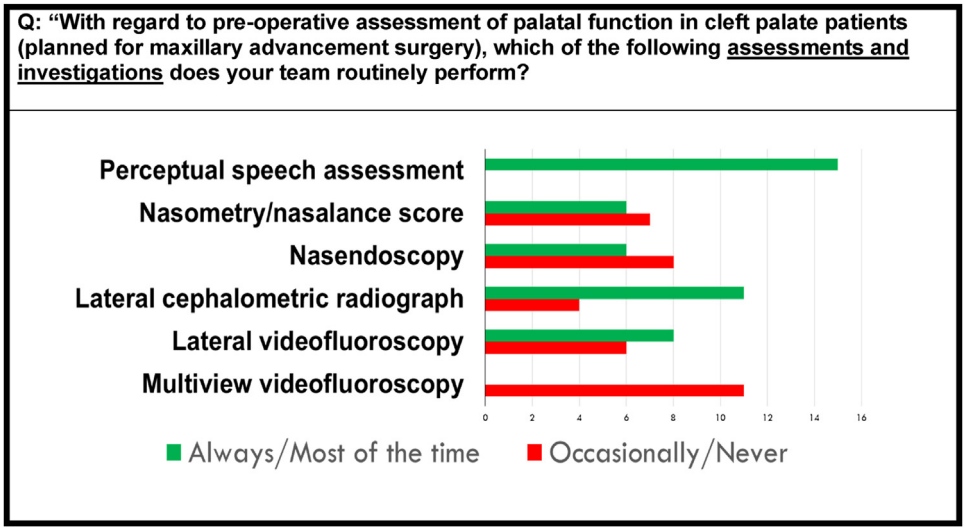

Fig. 1. Responses to survey question: With regard to preoperative assessment of palatal function in cleft palate patients (planned for maxillary advancement surgery), which of the following assessments and investigations does your team routinely perform?

The use of other instrumental assessments also varied. Five of 14 respondents used none.

Classification of VPF

While most respondents thought that their chosen assessment(s) allowed them to identify "adequate" and "inadequate" palatal function (14 and 13, respectively), five did not think they could reliably identify "borderline" cases.

Postoperative assessment of VPF

Most cleft teams did not do lateral videofluoroscopy routinely after jaw surgery (10/12), and only two respondents did. Similarly, most teams (9/12) did not do nasendoscopy routinely.

If VPF deteriorated after maxillary advancement, 13/14 respondents would monitor patients: nine for six months, three for up to 12 months, and one unit for up to three months.

Discussion

This study has highlighted wide variations among cleft teams in the UK and Ireland in the management of VPF in patients with cleft lip and palate who require maxillary advancement. These included the risk of VPI, effective methods of reducing it, and the consent of patients regarding its risk; the evaluation and investigation of VPF both before and after operation, and identification of "borderline" cases.

A possible explanation for this variation is the relative lack of reported evidence, and varying reports of the effects of maxillary surgery on VPF.[1–7] It can be difficult to interpret existing evidence because of a lack of distinction between patients with a cleft palate and those without, and because of small sample sizes.[5] Future studies should establish the sample size in advance and include clear inclusion criteria to delineate the groups.

Although guidance from both the RCSLT and ACPA emphasises the importance of instrumental assessments,[9–11] not all cleft teams did them routinely, and only 8/14 teams adhered to the RCSLT clinical guidelines for the evaluation of velopharyngeal dysfunction. The finding that two-thirds of respondents based their treatment plans on the preoperative assessments, while one third did not, shows a divergence in opinion over their clinical relevance.

An interesting finding was the apparent confusion over the meaning of "borderline" VPF. This term is widely used by research workers and has been variously defined.[5,12–14] The identification of "borderline" cases through adequate preoperative assessment may enable patients at high risk to be counselled accordingly and their treatment modified if necessary.

This type of study carries a risk of reporting bias. Although the sample size was small, all but one cleft unit in the UK and Ireland responded, which gave a response rate of 93%.

In conclusion, a national forum for multidisciplinary discussion about this issue would be beneficial and would allow for the standardisation of care across the UK and Ireland. Further research is needed to ascertain the effects of orthognathic surgery on VPF, and the potential clinical benefits of preoperative instrumental assessment.

Conflict of interest

We have no conflicts of interest.

Ethics statement/confirmation of patients' permission

Ethics approval not required. No patient's information was involved.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at https://doi.org/10.1016/j.bjoms.2018.11.006.

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