ORIGINAL ARTICLE

Oral surgery referrals at a UK dental hospital in the context of a managed clinical network: a mixed-methods study

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Abstract

Background and aims: To inform the first Welsh OS Managed Clinical Network (MCN), a mixed-methods study investigated existing patterns, quality, suitability and reasons for referral to secondary care at the University Dental Hospital in Wales.

Materials and methods: A random sample of 298 OS referrals were studied over a 6-month period. Data recording proforma included details on referral practitioner, patient and referral diagnosis. Referrals were categorised by Levels of complexity (Levels 1, 2 and 3) and face-to-face, semi-structured and audio-recorded interviews were conducted with five frequent referrers.

Results: The age range of patients was between 1 and 92 years, with over 58% (n = 174) women. Majority of referrals (80%) were from general dental practitioners. Top six practices accounted for a fifth (21%) of referrals, with three of these practices were corporate dental chains. Approximately, a third of referrals were categorised as Level 1 (37%), Level 2 (33%) and Level 3 (30%) complexity. 16% provided no medical history, and only 13% included supporting radiographs. Five themes emerged as reasons for oral surgery referrals: contract limitations, perception that new graduates lack OS practical skills, communication, practice resources and risk.

Conclusions: Priorities for the Wales OS MCN are to reduce inappropriate referrals to secondary care and to ensure quality referrals. Introduction of the pan-Wales electronic Referral Management System in May 2019 is welcome in this context. The newly formed Health Education and Improvement Wales, with lead roles in education, training and shaping the healthcare workforce, will form a vital part in tackling barriers for safe OS in primary care.

Clinical relevance

Scientific rationale for the study

The first Oral Surgery Managed Clinical Network in Wales was formed in April 2017. To inform the work of the Network, this study set out to investigate primary care referral patterns including quality, suitability and reasons for referrals at the only University Dental Hospital in Wales using quantitative and qualitative methods.

Principal findings

More than a third of referrals (37%) were of Level 1 complexity, that is, oral surgery procedures deemed suitable to be managed in primary care; 33% and 30% of referrals were Level 2 and Level 3 complexities, respectively. Five themes emerged as reasons for oral surgery referral to secondary care: contract limitations, perception that newly trained dentists lack the practical skills to undertake oral surgery, communication, practice resources and risk.

Practical implications

The Oral Surgery Managed Clinical Network aided by the introduction of the pan-Wales electronic Referral Management System will tackle inappropriate referrals and improve referral quality. The newly formed Health Education and Improvement Wales, with lead roles in education, training and shaping the healthcare workforce, will form a vital part in tackling barriers for safe oral surgery in primary care.

Introduction

Oral surgery services in the UK are provided in a variety of settings including primary care, specialist practices and hospitals by clinicians with different skill sets, General Dental Practitioners (GDPs), Oral Surgeons and Oral and Maxillofacial Surgeons. Medical Education England (MEE, 2010) and the Welsh Health Circular (2015) recommended plans for the future development of oral surgery provision in England and Wales, including a rapid expansion of primary care oral surgery referral services, integrated in clinical networks, with providers in secondary care[1,2]. These services were to be Consultant-led, supported by an increase in the number of oral surgery specialist training posts. A model for integrating services such as a Managed Clinical Network (MCN) has allowed service development across many specialities in the UK and beyond for many years[3,4]. MCNs function to make the referral processes between different levels of care more harmonised and convenient[5] and allow standardisation of patient care and greater focus on clinical outcomes[6].

In April 2017, the South East (SE) Wales Oral Surgery MCN was formed with the support of the Chief Dental Officer. As the first oral surgery MCN in Wales, it covered some of the most heavily populated areas, the capital Cardiff, Newport and the South Wales Valleys. Five NHS primary care specialist practices and four secondary care hospital-based Oral and Maxillofacial Surgery (OMFS) units provide oral surgery referral services within the MCN, accepting referrals from 70 dental and 87 medical practices. MCN provided a forum for key stakeholders, including clinicians and managers from three Health Boards (Aneurin Bevan, Cardiff and Vale and Cwm Taf) and representatives from Primary Care and Public Health Wales, with the broad aims to identify and develop coherent, safe and cost-effective oral surgery services. The three SE Wales Health Boards provide care for approximately 1.4 million residents (mid-year 2017 estimates) in urban and rural populations, just under half the total population in Wales[7].

Against this background, to inform the work of the newly formed MCN, this study investigated existing oral surgery referral patterns including quality, suitability and reasons for referrals at the only University Dental Hospital and School in Wales using quantitative and qualitative methods. Principal research questions were as follows: (1) What are the level of inappropriate oral surgery referrals? (2) What are the reasons for referring oral surgery cases to secondary care? (3) Do GDP oral surgery experience and competence influence referral patterns? (4) Do economic reasons weigh on decision to refer fewer complex cases? (5) What are the attitudes of GDPs for oral surgery provision in primary care? and (6) What are the barriers to providing a safe oral surgery service in primary care?

Methods

Oral surgery referrals

A random sample of 298 oral surgery referrals received at the department of OMFS over a 6-month period ending May 2017 were retrieved and analysed. All referrals were received in paper format on a standard referral template and referrals vetted as 'routine' (by a Consultant) were used for data extraction. One of the study authors (JA) was stationed in an office at the Dental Hospital where patient files were provided. No patient information was removed from the premises so to maintain patient confidentiality. Anonymity of patient records was maintained throughout the study.

A data recording proforma were developed to include referrer details, patient demography, medical and social history, referral diagnosis, indication for anaesthesia and diagnostic quality radiograph. Referrals were categorised by age groups (under 18, 18–24 years, 25–34 years, 35–44 years, 45–54 years, 55–64 years and those aged 65 years and over) and gender. Patients were categorised according to oral surgery complexity Levels 1–3 using descriptors originally defined by the Department of Health Advance Care Pathway Working Group (Fig. 1). The complexity levels do not describe contracts, practitioners or settings, but instead reflect the level of competence required by a clinician to deliver the prescribed oral surgery care[2,8]. Complexity level modifying factors include medical problems, social issues, patient anxiety and disability. Data analyses were undertaken using SPSS® software.
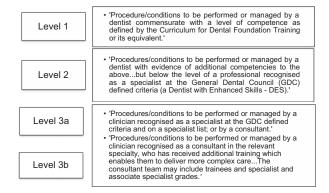
Figure 1 Complexity levels and procedures as described in the Welsh Health Circular and NHS Guide for Commissioning Oral Surgery.

GDP recruitment and interviews

Face-to-face, audio-recorded, in-depth semi-structured interviews were conducted with a convenience sample of five GDPs working in 'hotspot' dental practices in SE Wales, that is, practices recognised as referring high volumes of oral surgery patients to secondary care. Principal dentists were first approached via the Dental Primary Care Support Manager, Cardiff and Vale University Health Board, who sent initial invitations via email and followed-up with a letter. All GDPs approached in this way accepted the invitation to be interviewed. Contact details of the five willing GDPs were passed to the study researcher (KL). Dentists were provided with details of the study and participant information sheet approved by the local research ethics committee.

An interview framework (Table 1) was designed to focus on current oral surgery practice, study research questions and to elaborate on the findings from the review of referrals. Semi-structured interviews included open-ended questions, with suitable prompts as well as some questions about facts. Semi-structured interviews provide an effective way of achieving the research aims as they allow participants the freedom to highlight the issues which are important to them, while the use of interview framework ensures that all participants are asked certain key questions, and that all interviews cover the same broad areas[9]. In-depth interviews are also a more appropriate means of gathering sensitive, potentially stigmatising data, where issues of confidentiality and anonymity may be crucial to securing participants involvement.

Interviews were conducted by one of the authors (KL), also an experienced clinician, who has previously worked within the primary care setting. The interviewer first met with all five GDPs to get to know them, promote the study and to identify suitable interview locations. All interviews were conducted within dental practices at a mutually convenient time (outside working hours) to the dentist and the researcher. Prior to obtaining valid consent, sample GDPs were asked to confirm that they have read and understood the participant information sheet and whether they had any questions which needed clarification. GDPs were then asked to sign the consent confirming their agreement to take part in the interview. Practitioners were free to withdraw their consent at any time during the interview but unable to withdraw from the study following data analyses.

Data analysis

Data gathered from referral proformas were tabulated and analysed using simple descriptive statistics. Qualitative data, detailed notes (taken by the interviewer) and audio records from the five interviews were transcribed into a word document for analyses, making sure that all data were fully anonymised. Simple thematic content analysis was used to identify key themes in participants' narratives by reading and re-reading in detail. A public health expert (MM) helped with the data analyses. Ethical approval was secured from the Dental School Research Ethics Committee (Ref No. 09/MRE09/3).

Results

Oral surgery referrals

Of the 298 referrals, 174 were women (58%) and 124 men (42%). Analyses by age groups showed that most patients were aged between 25 and

Table 1 Structured GDP interview schedule

Current Oral Surgery practice
Reasons for referring less complex oral surgery cases to secondary care
Level of oral surgery experience or competence of primary care dentists
Economic reasons weigh on decision to refer less complex oral surgery patients to secondary care
Awareness of oral surgery referral criteria to secondary care
Attitudes of primary care dentists to undertake oral surgery in practice
Barriers to providing a safe oral surgery care in primary care and training requirements

34 years representing 28% (n = 83) of the sample. Age range was between 1 and 92 years. All referrals studied originated within Cardiff and Vale University Health Board catchment area (Fig. 2).

Majority of referrals were received from GDPs (80%; n = 241); 17% (n = 50) were from GMPs and a further 3% from other surrounding hospitals.

Key:

 Patient residence postcode

 Cardiff University Dental Hospital

Figure 2 Geographical distribution of patient referrals included in the study (n = 298). Data plotted using Multiplot.

Analyses by referring practices showed that six dental practices contributed to one-fifth (21%; n = 62) of total referrals. Of these, three dental practices were corporate chains and the other three were privately owned. Over a quarter of referrals (29%; n = 87) were considered 'urgent' by the referring practitioner. However, these referrals were downgraded to 'routine' during vetting by OS/OMFS Consultants. Despite being a mandatory data field, 16% (n = 48) of referrals provided no medical history. In all, 106 (35%) referrals used the phrase 'no relevant medical history' or its abbreviation 'NRM'. Asthma, a heart condition, depression, hypertension and diabetes (11%, 6%, 4%, 3% and 3%, respectively) were the most common medical conditions cited and 4% (n = 13) of patients had allergy to penicillin. In all, 31 (10%) patients were smokers and two were classed as 'heavy' drinkers. A fifth of referrals (n = 62; 21%) indicated that the patient was experiencing pain and 32 referrals described patients as being 'anxious' or 'dental phobic'. In addition, a total of 43 referrals specified the mode of anaesthesia needed for the patient; almost 10% (n = 29) indicated sedation and 5% (n = 14) requested treatment under general anaesthesia. In total, 39 (13%) referrals included radiographs (27 intra-oral periapicals, 10 bitewings, 2 orthopantomograms). Almost 37% of referrals (n = 110) were vetted as Level 1 complexity, that is, oral surgery procedures deemed suitable to be managed in primary care; 33% and 30% of referrals were Level 2 and Level 3 complexities, respectively (Table 2).

Table 2 Referrals by complexity levels

Complexity levels (%)	Number of referrals (%)
Level 1 (37)	
Removal of erupted tooth (including uncomplicated 8s)	55/298 (19)
Removal of roots	17/298 (6)
Management of unerupted, impacted, ectopic and supernumerary teeth	30/298 (10)
Craniofacial pain and TMD	12/298 (4)
Level 2 (33)	
Surgical removal of tooth and uncomplicated 8s	27/298 (9)
Surgical removal of roots	13/298 (4)
Surgical removal of uncomplicated ectopic teeth	13/298 (4)
Surgery as part of orthodontic treatment planning	1/298 (0.3)
Level 3 (30)	
Opinion/assessment	53/298 (18)
General anaesthetic	14/298 (5)
Extensive medical history	27/298 (9)

Oral surgery referrals: thematic insights

Each interview lasted approximately 1 h. Five interviews achieved data saturation as GDPs were coming up with the same points. Thematic analyses of the transcripts identified five key themes for referrals to secondary care; contract limitations, perception that recently trained dentists do not have the practical skills to undertake oral surgery, communication between OMFS and GDPs, practice resources and GDPs risk averse in undertaking oral surgery in primary care.

Contract limitations
All five GDPs felt that the remuneration for carrying out extractions in primary care was insufficient. All felt that if better remunerated they were more likely to attempt oral surgery at their NHS practices.

> 'If it's one of my NHS patients I would probably refer that to the hospital because I'm not getting paid to do it' **GDP 1**
>
> 'It's a bit of a joke to be honest, we are stuck with the contract we have, I know they say swings and roundabout but it would definitely make a difference. I think it does make a difference when you have a patient who has gross decay, needing multiple fillings, a few simple extractions and then a surgical extraction and you're only getting a band 2. The amount of work to get those 3 UDAs, practitioners are going to refer. If there are multiple extractions, although they might be all easy extractions if there 18 of them then they are going to refer from a financial reason' **GDP 2**
>
> 'I certainly don't feel that 3 UDAs is justifiable for a surgical 8' **GDP 3**

Perception that recently trained dentists do not have the practical skills
All dentists interviewed, two of whom were trainers, felt that new dental graduates lack the practical skills to undertake difficult extractions.

> 'The level of training you receive as an undergraduate prepares you for simple extractions and simple extractions only. There isn't enough exposure to difficult extractions in the hospital. I know your training doesn't stop when you qualify, it continues throughout your VT' **GDP 3**

Practitioners also felt that new dental graduates lacked confidence in undertaking oral surgery:

> 'I'm also noticing, bear in mind I'm only seven years qualified that the students qualifying now are even less confident than those seven years ago. But there are courses out there at a post-graduate level, so is it their fault if they haven't identified a weakness in their own skills and gone on to do more training?' **GDP 5**

One trainer was more explicit in describing both the lack of experience and confidence of new dental graduates in undertaking oral surgery:

> 'Seeing the undergraduate comes out with what oral surgery skills they have was one of the reasons I packed up being a trainer because they couldn't take teeth out' **GDP 4**

Communication between OMFS department and GDPs
None of the GDPs interviewed were aware of hospital waiting times. All felt that the hospital should be contacting GDPs who inappropriately refer and should encourage those referrers to attend postgraduate courses to improve oral surgery skills and confidence.

> 'If they [the OMFS Department] have a referral they feel is inappropriate they should inform the practitioner and what should be done, so it would be difficult for the same practitioner to put in a similar referral again. I think a simple 'inappropriate referral' letter back doesn't help solve the problem.' **GDP 5**
> 'Maybe those [post-graduate] courses are things that those practitioners who refer things inappropriately should be encouraged to attend.' **GDP 2**

Practice resources
Comments from GDPs related to not being confident to undertake oral surgery including extractions.

> 'Practice you are on your own regardless of what anybody says, if something goes wrong it's on you' **GDP 1**
> 'Once you are in practice you tend to do a lot of the same thing and when you do something you don't do very often you are going to become un-stuck. Even if you go on these oral surgery courses, you need someone to hold your hand afterwards' **GDP 2**

Risk averse
A theme that emerged in the study was that GDPs were risk averse when it came to carry out oral surgery in primary care.

> 'The contract is a disincentive to anything that involves any sort of risk' **GDP 3**
> 'Most people are risk averse, so they aren't going to try anything that might result in any complication' **GDP 1**
> 'I don't just think that the UDA system should be remunerated solely on complexity, I think the number of risks involved need to be taken into consideration. Molar endo is complex but it doesn't carry the same amount of risks that a surgical 8 does' **GDP 5**

Discussion

Medical Education England (2010), Oral Surgery Working Group Report on 'Future Implementation of Oral Surgery Services in Wales' (2013) and the Welsh Health Circular (2015) recommended that Levels 1 and 2 oral surgery procedures can be performed by GDPs and Dentists with enhanced skills[1,2]. It is safe and effective to treat a wide range of patients with oral surgical conditions in primary care[10]. Anticipated surgical difficulty, complex patient medical history and anxiety, inadequate practitioner surgical experience and ease of referral have all been documented as reasons for referring patients requiring oral surgery to secondary care[11]. A large proportion, typically between 20 and 60%, of referrals received in hospital OMFS departments can be treated within primary care by a suitably trained clinician[12]. In this mixed-methods study, 69% (n = 207) of secondary care oral surgery referrals

were categorised as Levels 1 and 2 and hence were deemed inappropriate. Study also identified five key factors as reasons for referrals – contract limitations, referrer oral surgery skills, communication, practice resources and risk.

NHS in Wales is delivered by seven Health Boards responsible for healthcare within their particular geographical area. Health Boards tend to function independently with a centrally set budget and provide acute and community-based services. Over the last decade, there has been a steady increase in GDP referrals to hospital OMFS Departments leading to increased referral to treatment times (currently set at 26 weeks in Wales), suboptimal patient accessibility and provision of less cost-effective treatment[13,14]. Demand outstrips capacity for oral surgery provision – currently, more than 2000 patients are on the waiting list to be seen by an OS/OMFS Consultant at Cardiff Dental Hospital. Similar oral surgery waiting lists are commonplace in Welsh hospitals. Development of a high-quality patient-centred care relies on using standardised healthcare principles, which are consistently applicable. This means that it would be generally inappropriate to provide treatment in secondary care which can be safely and effectively provided in primary care. Reconfiguration of oral surgery services is necessary to reduce waiting times, enhance quality and cost-effectiveness of patient care and improve overall patient journey. Findings in this study have informed MCN goals to develop primary care oral surgery services across established 'rigid' boundaries of the three Health Boards and to develop better links between primary and secondary care within Health Board areas. The introduction (in May 2019) of the new all-Wales electronic referral management system (e-RMS) is welcome in this context.

General Dental Practitioners are expected to be competent in performing extractions of uncomplicated teeth and roots, familiar with diagnosis and management of temporomandibular joint disorders and minor soft tissue pathologies[15]. Furthermore, practitioners should not undertake any procedure beyond their ability, which is underpinned as one of the nine standards, that is, a dentist must 'work within [their] professional knowledge and skills'[16]. According to this study, GDPs are risk averse in providing oral surgery in primary care. Potential complications in extraction, including post-operative bleeding, oroantral communication and inferior alveolar nerve damage, may weigh heavily on dentists' mind particularly among new graduates. A report into surgeons' physical and emotional well-being found negative reactions varying from 'anger and irritation, sadness and depression to shame and self-blame' following complications[17]. Fear of litigation may also drive referral patterns. Oral surgery procedures incur a high frequency of dental claims from patients. Post-operative pain, damage to an adjacent tooth or extraction of the wrong tooth, neurological deficit and soft tissue injury were among the most common patient claims against the NHS[18]. Trigeminal nerve injury is one of the most problematic outcomes in oral surgery[19]. Frequently injured branches are the inferior alveolar and lingual nerve resulting from third molar surgery; 35% (n = 105) of secondary care referrals in this study were related to third molar removal. Lack of GDP confidence and competence in undertaking oral surgery and limited availability of equipment in dental practices have also been reported[20]. Risks associated with oral surgery procedures, coupled with the potential legal implications and expenses should a complication arise, are proving unattractive to GDPs who are not confident in their management of such procedures. The oral surgery MCN in Wales will have an important role in identifying referrer training needs. Engagement with Health Education and Improvement Wales with its lead role in education, training and shaping healthcare workforce in Wales is important.

This study provides evidence that inadequate remuneration for oral surgery procedures in primary care leads to inappropriate referrals. Under the current NHS General Dental Services contract, extractions, surgical removal of cysts, buried roots and impacted teeth fall under Band 2 treatment. In Wales, this is charged at £46 and equates to three Units of Dental Activity (UDA) for the practitioner. It is widely recognised that the current dental contract is focused on treatment activity, and does not incentivise needs led care, prevention or make the best use of the skills of the whole dental team. There are regional and national variations in primary care oral surgery contracts relating to contract type and level of remuneration[21]. Contract reform for NHS dentistry has been identified as a key priority by the Welsh Government in the 'Taking Oral Health Improvement and Dental Services Forward in Wales' (2017)[22].

Efficient service and good patient experience in secondary care depend on appropriate referrals consisting of all necessary clinical and administrative data aligned to agreed clinical pathways and referral protocols (NHS Standard Contract for 2017–2019)[23]. This study identified a number of non-compliant

referral errors – 77% of referrals had no supporting radiographs, 16% did not mention patients' medical history and 5% were deemed illegible. Paper-based referrals and the inability to send electronic radiographic images may have been contributory. Missing data lead to patient harm from delayed diagnosis, longer referral to treatment times, increased patient anxiety and service dissatisfaction. Triaging is not possible, and patients may be exposed to unnecessary repeat radiographs. It is equally important to maintain good communication from secondary to primary care – dentists interviewed in this study felt that inappropriate referrals need to be highlighted with the referrer and support given to develop GDP oral surgery skills. Oral surgery MCN has recently developed 'Once for Wales' oral surgery and OMFS electronic referral proforma with referral guidelines for practitioners. This together with the all Wales e-RMS is expected to deliver high-quality referrals to secondary care, aided by rejection and feedback of inappropriate referrals at source.

This study identified referral hotspots in SE Wales possibly reflecting a greater need for oral surgery care within these areas. Reasons for high referrals are multifactorial and may include socio-economic, cultural and individual patient lifestyle factors linked to increased chances of dental disease. Poor oral health is associated with low socio-economic status or deprivation[24]. Top six referral practices in this study accounted for a fifth of all referrals and are located in the most deprived areas in Wales. Three of these practices are corporate dental chains. Typically, these organisations have a high turnover of staff, including newly qualified dentists. It is possible that new graduates with limited experience and confidence in undertaking oral surgical procedures led to increased referral to secondary care.

South East Wales oral surgery MCN also covers the only Dental School in Wales (Cardiff) which has an annual intake of 80 students into the BDS course. Students are introduced to simple exodontia in year three and expected to achieve competency in year 4, necessary for progress and 'sign-up' for final BDS. Students become familiar with surgical exodontia in years 4 and 5, for example in mucoperiosteal flap design and bone removal in ex-vivo practical skill and patient treatment sessions. In addition, dental core and speciality trainees continue to develop their skills in surgical exodontia. Hence, a steady flow of patients from primary care requiring simple and surgical exodontia (Levels 1 and 2 complexity) is important to maintain undergraduate and postgraduate training. A significant shift in oral surgery provision

away from secondary to primary care in SE Wales will be detrimental to BDS students and trainees. This balance needs to be assessed carefully, so not to dilute skills development for future dentists. Oral surgery MCN, in collaboration with the Dental School and Health Board, has an important role in ensuring adequate undergraduate and postgraduate training needs in any reorganisation of oral surgery services.

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