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Evaluation of the Information Provided by UK Dental Practice Websites Regarding Complications of Dental Implants

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Key Points

- Highlights a lack of standardisation of patient information provided by UK dental practice websites regarding suitability and complications of dental implants.
- Reminds registrants that there is an increasing trend in patients seeking their own information regarding dental implants and other treatment options online.
- Reminds registrants of their duty to provide material that is accurate, honest, and informative, in line with GDC's principles of ethical advertising.

Abstract

Introduction

Dental Implants are a popular option for replacing missing teeth. When searching for information regarding dental implants, patients may first look to their dental practice website. The aim of this study was to assess the variance of patient information provided regarding implant complications on dental implant practice websites.

Materials and Methods

Inclusion criteria for this study were dental practices within the Greater Glasgow & Clyde health board and practices with an active website. Completeness was assessed using a 6-point score based on the BAOS 'Information for Patients' leaflet and ADI 'Considering Dental Implants? – A Patient's Guide to Dental Implant Treatment' leaflet.

Results

90.7% (n=107) of practices provided accessible implant information on their websites. However, only 37.3% (n=44) mentioned one or more specified dental implant complications. Pain/discomfort was the most frequently stated complication (n=41/118); implant failure was only mentioned by 19 practices (16%). The mean number of complications mentioned by the 118 practices offering dental implants was 1.1.

Discussion

As implant dentistry grows, there may be concerns over patient expectations. To overcome lack of quality assurance on the internet, dentists can provide factual information on their websites. They should be aware of their duty to provide material that is accurate, honest, informative, and not potentially misleading.

Keywords Dental implant complications, Dental practices, Ethical advertising

Introduction

Dental Implants have become a popular and increasingly desired option for the replacement of missing teeth worldwide. In the UK in 2012, the Association of Dental Implantology estimated that approximately 130,000 individual dental implants were being placed each year and that figure is now expected to have doubled¹. The global dental implant market is expected to grow by a 5% Compound Annual Growth Rate (CAGR) between 2019-2025².

Over recent years, there has been substantial research and developments in dental implantology^{3,4,5,6} as well as an increased availability of the service. As dental implants are becoming increasingly prevalent, it is important to ensure that patients and the public are well informed of the risks involved in such procedures, and the alternative options available.

The general public's perception of dental implants is that they provide a long-lasting solution to missing teeth. Possibly for this reason, patients are found to prefer dental implants over alternative options for replacement of missing teeth⁷.

Dental implants have a reported success rate of 90-95% in the literature^{8,9}. However, the main risks of implant placement include failure of osseointegration, pain, bleeding, swelling, bruising, and wear or loosening¹⁰. Infection, smoking, medical history, and lack of bone structure could further complicate implant placement, and bone grafting or sinus lift procedures may become necessary, both of which come with additional risks^{9,10}.

In the post-Montgomery¹¹ era, it is paramount that patients are informed of, and fully understand, the risks of surgical procedures. With respect to dental implants, it is expected that information relating to the procedure, as well as the risks, benefits and alternatives involved, is provided during each individual implant consultation. However, this information is not always absorbed and retained¹². It is reported that approximately 40-80% of material delivered to patients at consultation cannot later be recalled¹³. Patients have a right to information that allows them to be involved in making decisions about their care¹⁴. As such, patients may turn to the internet to gather more information regarding their treatment and this is now increasingly possible due to advances in technology.

When searching the internet for information regarding dental health or treatment, patients may first seek to acquire this from their dental practice website and dental practices can serve as a reliable source for patient information with regards to treatment procedure, risks, benefits, and alternatives.

Dentists have a duty and responsibility to provide honest and accurate information with regards to treatment and are regulated by the General Dental Council (GDC).

It has been observed that there are few studies that assess the information available online with regards to procedures related to oral surgery^{15,16}. The aim of this study was to assess the frequency and variance of patient information provided on dental implant practice websites, compared to information available on the British Association of Oral Surgeons' (BAOS) and Association of Dental Implantology's (ADI) websites.

Materials and Methods

This is a cross-sectional study conducted in April 2020. Data was gathered to assess three parameters:

1. Provision of dental implants in selected practices
2. Presence of patient information regarding implants on the practice website
3. Specific mention of the following dental implant complications/risks: infection, pain/discomfort, swelling, bleeding, bruising, failure.

The inclusion criteria for this study were dental practices within the Greater Glasgow & Clyde (GG&C) health board and dental practices with an active, accessible website at the time of the study.

The 2018-2019 Annual Report on Primary Care Dentistry in Scotland¹⁷ was used to identify the total number of dental practices providing either NHS or mixed NHS and private dental care. There was no data available on fully private dental practices. There were a total number of 980 registered independent dental practices in Scotland on March 31st, 2019, with 263 in the GG&C region.

A pilot study was carried out using the NHS GG&C online database, to identify dental practices within the health board. 57 practices were identified; 29 were excluded as they had no active or accessible website. The pilot study looked to identify specific mention of seven dental implant complications: non-osseointegration, pain, swelling, bleeding, bruising, loosening and failure. Several of these complications were noted to overlap, namely risks of non-osseointegration, loosening and failure. The parameters for the study were then revised as noted above to include infection, as well as a broader definition of failure which encompasses non-osseointegration and loosening. Furthermore, data was also collected on the mention of smoking, peri-implantitis, and the possible need for bone grafting procedures.

A single larger database, NHS Inform Scotland Service Directory, was then used to identify dental practices within the specified health board. A total of 256 practices were identified; 56 had no active or accessible websites and were therefore excluded from the study. The data was collected independently by two assessors (IR, FE) with each website attaining a score between 0 and 6 (Table 1). This was then compared to remove bias and human error. The data was analysed and is presented by means of numerical and descriptive analysis.

<i>Complication</i>	<i>Maximum score</i>
<i>Infection</i>	1
<i>Pain/discomfort</i>	1
<i>Bleeding</i>	1
<i>Bruising</i>	1
<i>Swelling</i>	1
<i>Failure</i>	1
<i>Total</i>	6

Table 1: Proforma for assessing complications mentioned on websites

Results

The total number of practices that fit the inclusion criteria was 200. Through assessment of the practice websites, 118 were found to offer dental implants (59%).

82 practices did not offer implants, but 12 of these offered a referral service to an implant practice.

107 of the 118 practices that offer dental implants provided accessible patient information regarding the dental implants on their websites (90.7%).

74 practices (62.7%) provided no information regarding any of the specified dental implant complications: infection, pain/discomfort, swelling, bleeding, bruising, failure.

44 practices (37.3%) gave mention to one or more specified dental implant complications. The frequency of mention of each specified complication across all 118 implant practices is detailed in the table (Table 2) below:

Dental Implant Complication	Number of Implant Practices (n = 118)	% of Implant Practices
Infection	16	13.6%
Pain/Discomfort	41	34.7%
Swelling	30	25.4%
Bleeding	13	11%
Bruising	14	11.9%
Failure	19	16.1%

Table 2: Number (%) of dental practices that mention each specified dental implant complication.

Individual practices varied in the number of dental implant complications noted. This is detailed in the table below:

Number of Specified Dental Implant Complications Mentioned	Number of Implant Practices (n = 118)	% of Implant Practices
0	74	62.7%
1	8	6.8%
2	19	16.1%
3	1	0.8%
4	4	3.4%
5	4	3.4%
6	8	6.8%

Table 3: Number of specified dental implant complications mentioned per implant practice website.

Only 8 practices out of 118 (6.8%) mentioned all six complications as outlined on BAOS and ADI.

The mean number of dental implant complications mentioned by the 118 practices offering dental implants was 1.1. The standard deviation was 1.8.

16.9% (n=20/118) of practices discussed the effect of smoking on the outcome of implant treatment.

22.8% (n=27/118) of websites discussed peri-implantitis and/or gum health and the need for regular maintenance of dental implants, including the importance of oral hygiene.

The possible need for bone grafting or other procedures such as sinus lift, was mentioned in 24.6% (n=29/118) of websites.

Discussion

This is the first study evaluating the information provided on dental implants by dental practices online in the United Kingdom. The results of our study signal a deficiency in the information provided by UK dental practices online surrounding the complications of dental implants. Advances in technology have made online information with regards to health conditions and oral health conditions readily accessible to patients and the public.

The 2019 UK government statistics showed that 90% of households in Great Britain have access to the internet¹⁸. In 2015, 73% of internet users in the United Kingdom used the internet to search a health-related symptom¹⁹. With regards to oral health, implant related information ranks in third place, following aesthetic dentistry and dental amalgam concerns²⁰. This is in keeping with the current trends observed. It is well recognised that patients are likely to be influenced by the health information they find online²¹. A study by Kwon et al found that age and income are predictive factors associated with trust in online sources of health information, whereas disease history and education were not proven to be of significance²².

General search engines are the most popular means of obtaining information with regards to health. In this study however, the focus was placed on dental practice websites as patients are expected to initially turn to these for more information regarding treatment, costs, and procedures. There are a growing number of dental practice websites^{18,23,24,25}. These websites do not detract from the responsibility of clinicians in providing individualised patient information and obtaining informed consent, however they can provide a reliable source of supplemental information.

Through assessment of the practice websites, we found that 118 out of 256 practices offered dental implants (59%). This information was often located clearly on the home page, or within the 'Treatments' section. Clarity is believed to positively influence the reader's trust²⁶. 107 of the 118 practices that offer dental implants provided accessible patient information of some degree on their websites (90.7%). This information was variable and was commonly presented as a series of 'FAQs', such as:

- What are Dental Implants?
- Do Dental Implants Hurt?
- How Long Do Dental Implants Last?

This format is similar to the patient information provided on the BAOS and ADI websites^{9,10}. The BAOS and ADI outline the main risks or complications surrounding dental implants on patient information leaflets which are available online. We scored each website 0 to 6 points depending on the number of complications mentioned (infection, pain, bleeding, bruising, swelling, failure).

Despite most practices providing information on dental implants, only 44 out of 118 (37.3%) dental practices mentioned one or more of these complications. 74 out of 118 (62.7%) dental practices scored 0 out of 6 in the mention of complications. This is comparable with Ali et al's study which reported 60% of websites provided no information on the complications of dental implants¹². Of the complications mentioned,

pain or discomfort was the most frequently stated (n=41/118), followed by swelling (n=30/118). The least mentioned complication was bleeding (n=13/118), and the risk of implant failure was only mentioned by 19 dental practices (16%).

Furthermore, the BAOS and ADI mention specific risks regarding smoking and peri-implantitis. These, however, were only stated in 16.9% (n=20/118) and 22.8% (n=27/118) of websites, respectively. The possible need for bone grafting or other procedures such as sinus lift, was mentioned in 24.6% (n=29/118) of websites.

There is a lack of regulation of the materials provided online, and studies have concluded that inadequate patient information is provided with regards to dental implants^{12,27,28}. The results of our study are in agreement with this. This could be due to the fact that dental practice websites are commercially motivated, and dentists may not necessarily wish to emphasise complications, as this could lead to negative impacts on their service provision.

Dental practice websites may be authored by dentists or other sources, such as practice managers or a third-party web design company. However, it is the duty of the dentists to ensure that the information provided on their practice website is accurate. It has been previously reported that clinicians may possibly be unknowingly non-compliant as they perhaps may not be aware of the GDC advertising rules and regulations²⁹.

Dentists in the United Kingdom are regulated by the GDC and have a duty of care towards their patients and a responsibility to practice ethically. One of the nine core ethical principles of practice is effective communication³⁰; however, professionalism also encompasses honesty and integrity which are central values in healthcare. In 2012, the GDC outlined principles of ethical advertising and delivered specific guidance to dentists wishing to advertise their services online³¹. They advise that statements which are intended or likely to result in unwarranted expectations must be avoided, and that false advertising which has the potential to mislead patients is unprofessional. A study carried out in Wales in 2016, found that none of the (436) NHS dental practice websites were 100% compliant with the GDC's principles²⁵.

Jayaratne et al assessed the readability of patient information on dental implants online in 2013 and found that 87.18% of websites were difficult to read²⁷. This is similar to another study carried out by Leira-Feijoo et al in 2014 which concluded that the online information on dental implants was difficult to read for the average patient and was of poor quality²⁸.

Concern over the quality of information provided on the internet is a common phenomenon within dentistry^{12, 27,28,32,33}. As implant dentistry grows, there are concerns over the unrealistic expectations that patients may have with regards to dental implants. There is a wide range of information available online and on social media, but this has limited quality assurance and could contain incorrect content.

Dental professionals have the opportunity to provide balanced and factual information for patients by advertising services online, and this is supported by the GDC. Although dental implants have a reported success rate of 90-95%^{8,9}, it is important that patients are made aware of the limitations surrounding them. Whilst

dentists may specify common risks associated with the placement of dental implants on their websites, an individualised consultation to discuss the details and likelihood of complications, and their potentially significant consequences to the patient, must take place. The case of *Montgomery v Lanarkshire health board*¹¹ redefined the process of obtaining informed consent in the UK: implant dentists must establish a duty of care to warn patients of all material risks, many of which may not have been included on their websites. The shift away from the *Bolam* and *Hunter v Hanley* tests³⁴ has given patients more autonomy and encourages a more active involvement in decisions relating to their care.

Health literacy rates across England may be as low as 39%³⁵ and it has been previously documented that patients retain 20-60% of information provided at consultations¹³. Therefore, there is no doubt that they must be given detailed information leaflets following consultations, otherwise they will turn elsewhere to attain supplementary information. Aids such as leaflets, videos, and websites can be used as tools to facilitate informed consent. Dentists run the risk of fitness to practice proceedings if they potentially mislead patients²⁹. Members of the dental team should be aware of their duty to provide material that is accurate, honest, and informative.

Conclusions

There is great variance in information regarding dental implants on practice websites, which ranges from no mention of any specified dental implant complications in most websites, to mention of all six.

The increasing trend in patients seeking their own information supports the notion for inclusion of more relevant key information regarding implants and other treatment options online on practice websites.

Practice websites should therefore aim to provide material which could enable a patient to reach a decision regarding their treatment, and not be potentially misleading.

Declaration of interests

The authors declare no conflicts of interest.

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