Assessment of Quality of Patient Generated Photographs in the Oculoplastic Clinic

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Abstract

Introduction
To assess quality of patient generated photographs of presumed benign eyelid pathology in the oculoplastics clinic. Still photographs frequently provide better image quality than videos where poor image quality and lighting can hinder diagnosis.

Method
Prior to a virtual video consultation in the benign eyelid clinic new patients were asked to submit self-captured photographs to a designated email inbox. Photographs for 300 consecutive patients between 29th April and 6th May 2021 were reviewed by two independent observers GG and HK. Photographs emailed to the inbox from follow-up patients or sent by a medical professional were excluded. Photographs were assessed to see if there were of sufficient quality to allow for diagnosis.
Each patient's submitted photographs were independently graded as either inadequate, adequate or excellent based on a previously agreed standard. Furthermore observers also noted whether the images were adequately focussed and well lit.

Results
300 patients submitted 895 photographs to the shared inbox in the time period. 57.3% (172) of participants were female and patient mean age was 42.49 years old (SD=16.37) ranging from 16 to 90. Mean number of photos submitted per patient was 2.98 (Sd = 1.84) ranging from 1 to 15 images. 84.5% of photographs were graded as excellent (40.5%) or adequate (44.0%). There was no statistical difference in overall quality in different age groups (Chi Square test p-value = 0.79). Inter-reader reliability score with Cohen's Kappa was 0.77 for overall grade and 0.86 and 0.81 for focus and lighting scores respectively demonstrating good concordance.

Conclusion
Patients of all ages are able to provided photographs of adequate quality to allow for diagnostic assessment of benign eyelid lesions.

Introduction

In response to the Covid-19 pandemic our institution rapidly deployed video consultations, using Attend Anywhere, a browser-based video consultation platform across many ophthalmic subspecialties including oculoplastics.

As the pandemic has continued a substantial number of our appointments have continued to be offered as virtual consultations; this has allowed us to continue to maintain patient access to healthcare despite intervening public health social distancing measures. During the pandemic we have refined and developed our patient pathways in the adnexal service. We introduced the used of patient generated photographs in addition to video consultations as still photography supplements synchronous video consultations by providing superior resolution images allowing enhanced assessment of small eyelid lesions.

We have harnessed patient-generated data and photographs as part of the remote clinical assessment to reduce the viral transmission and also to reduce burden on ophthalmology outpatient service while improving the diagnostic ability of clinicians assessing patient remotely.

The literature shows well-established teledermatology services have been utilising this mode of clinical assessment of both benign and malignant skin conditions with high patient and provider satisfaction. 4 The use of patient generated photography for clinical assessment has been well recognised in dermatology and has previously been shown to allow for diagnosis in 75-83% of cases2,3 suggesting that patients are frequently able to provide adequate photographs of skin lesions. The use of still photography in combination with remote videoconsultation has previously been shown to be a reliable and effective way of examining adnexal patients when in person examination is not feasible.5

Methodology

All new adult patients referred our institution with suspected benign eyelid lesions were triaged to a virtual benign eyelid lesion adnexal clinic. All patients attending this clinic were asked to submit self-captured photographs to a designated email inbox prior to a video consultation. Patients were asked to include their hospital number with the email. Where available, patient hospital numbers were used to identify the patient's electronic medical record. Alternatively, patients were identified using their name and any other identifying information included in the email or were contacted via email to request further details. Patients were not asked to include any description of symptomatology or their presumed diagnosis.

Photographs for 300 consecutive patients submitted between 29th April and 6th May 2021 were assessed. The images were reviewed by two independent observers (GG and HK). Photographs for follow up or post-operative patients were excluded. Photographs submitted by a clinician who had seen the patient face to face in an oculoplastics clinic were also excluded.

Data collection took place on Microsoft Excel and patients were coded by hospital number and date of birth. Each patient's submitted photographs were independently graded by as either excellent, adequate and inadequate based on a previously agreed standard. Examples of photographs grading are demonstrated in Figure 1. Furthermore, observers also noted whether the images were adequately focussed and well lit.



Examples of photos submitted: Photo (a) excellent as well lit, adequately focussed with side profile demonstrating elevated lesion; photo (b) graded example of well lit photo clearly demonstrating ectropion; photo (c) adequate photo of upper lid chalazion as lesion identifiable; photo (d) example of poorly lid photo although lesion visible; photo (e) graded inadequate due to poorly focussed image; photo (f) graded inadequate as poorly lit and poorly focussed image.

Results

300 patients submitted 895 photographs to the shared inbox between 29th April 2020 until 6th May 2021. 57.3% (172) of participants were female and patient median age was 42.5 years old (SD=16.37) ranging from 16 to 90. Mean number of photos submitted per patient was 2.98 (SD = 1.84) ranging from 1 to 15 images. There was a weak correlation between age and number of photos submitted with younger patients more likely to submit a higher number of photographs (Pearson correlation -0.12 p = 0.03).

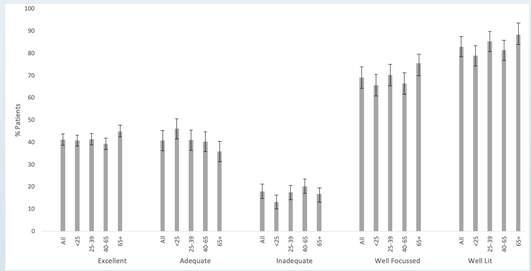
84.5% of photographs were graded as excellent (40.5%) or adequate (44.0%). There was no statistical difference in overall quality in different age groups (Chi Square test p-value = 0.79. There was also no statistically significant difference in ability to submit adequately focussed (Chi Square test p-value = 1.02) or well lit patients (Chi Square test p-value =0.78) among patients in different age groups.

Inter-Observer Reliability
Concordance between observers for the overall quality of patient's images, measured using Cohen's Kappa, was found to be k=0.77 (P= <0.01). A greater agreement score of k=0.86 (P<0.01) was found with deciding whether images were in focus. Whilst for determining whether images were well lit, inter-rater reliability was k=0.81 (P<0.01).

Demographics

Age	
<25	38 (12.7%)
25-39	106 (35.3%)
40-65	118 (29.3%)
65+	39 (13%)
Gender	
Female	172 (57.3%)
Male	128 (42.7%)

Results of image quality assessment



Conclusion

Patients of all ages are able to provide photographs of adequate quality to allow for diagnostic remote assessment of benign eyelid lesions. In our patient cohort, age was not a barrier to successful submission of photographs of adequate quality. 80.8% of patients over 65 years were able to submit either adequate of excellent quality photographs and there was no statistically significant difference between different age groups.

Quality improvement work is now in progress to further improve image quality through patient education and ensure adequate patient identifiers are included with each email to reduce clinical risk or incorrectly identifying patients.

While the majority of patients have access to internet services, a 2019 report by the Office of National Statistics (ONS) showed that in 2018, 10% of the UK adult population were internet non-users.6 While the number of internet non-users among UK adults is declining, when designing patient pathways using email and web browser-based platforms it is important to recognise that these pathways can exclude some of the most vulnerable patients. Alternative pathways such as traditional face-to-face consultations may need to be offered for these some patients to digital exclusion.

Still patient photography as generated by patients offers an effective and safe way to obtain good quality images of benign lid pathology as the Covid 19 pandemic continues. It may also reduce the number of outpatient visits in the adnexal clinic by allowing better assessment of patients virtually reducing the need for further in person assessment .

The majority of patients seen in our cohort are of working age, by capturing and submitting their own photographs patients are able to do so at time and place convenient to them. This may increase patient convenience by reducing the need to take time off work to attend and reducing the time and cost of transport to clinic. Virtual clinics are potentially more environmentally friendly by reducing the carbon footprint from patient transport to clinic.

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Conclusion

Our findings demonstrate that patients can provide adequate quality photographs that allow effective and accurate remote diagnostic assessment of benign eyelid lesions. Moreover, our study revealed that older age was not a barrier to the successful submission of adequate quality photographs. 80.8% of patients over 65 years submitted either adequate or excellent quality photographs with no statistically significant difference compared to other age groups.

References

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