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The impact of COVID19 on the presentation, diagnosis and management of cutaneous melanoma and squamous cell carcinoma in a single tertiary referral centre

--Manuscript Draft--

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Corresponding Author:	Adam McClean, BMBS Bradford Teaching Hospitals NHS Foundation Trust UNITED KINGDOM
First Author:	Adam McClean, BMBS, BMedSci, MRCS(ENT)
Order of Authors:	Adam McClean, BMBS, BMedSci, MRCS(ENT)
	Paolo Matteucci, MB ChB MRCS FRCS(Plast)
	Joshua Totty, MBBS, PGCertRes, MRCS, MD, FHEA

Manuscript (Please include all author details)

Hull York Medical School

Hull
University of Hull
Hull, HU6 7RX, UK

York
University of York
York, YO10 5DD, UK

T 0870 1245500
info@hyms.ac.uk
www.hyms.ac.uk

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Dear Editors,

We are pleased to submit our manuscript, *"The impact of COVID19 on the presentation, diagnosis and management of cutaneous melanoma and squamous cell carcinoma in a single tertiary referral centre"* to JPRAS.

In this retrospective matched cohort study, we have identified significant discrepancies in the presentation and identification of both melanoma and cutaneous SCC, arising as a result of the COVID-19 pandemic, which is still ongoing and causing a significant threat to services.

The authors of this manuscript have read and made all reasonable efforts to ensure it is compliant with the JPRAS "Guide for Authors".
All authors have seen and agreed to the submitted version of the paper.
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Adam McClean – Core Surgical Trainee

Hull York Medical School

Hull
University of Hull
Hull, HU6 7RX, UK

York
University of York
York, YO10 5DD, UK

T 0870 1245500
info@hyms.ac.uk
www.hyms.ac.uk

22nd April 2022

Dear Reviewers,

Thank you for your feedback regarding our manuscript “The impact of COVID19 on the presentation, diagnosis and management of cutaneous melanoma and squamous cell carcinoma in a single tertiary referral centre”
This has been reformatted into a short communication comprising of 876 words, 2 tables and 5 references.

Adam McClean – Core Surgical Trainee

Title: The impact of COVID19 on the presentation, diagnosis and management of cutaneous melanoma and squamous cell carcinoma in a single tertiary referral centre

Authors:

Adam McClean[1]

Paolo Matteucci[1]

Joshua Totty[1,2]

Affiliations:

[1]Department of Plastic and Reconstructive Surgery, Hull University Teaching Hospitals NHS Trust, Hull, UK

[2]Centre for Clinical Sciences, Hull York Medical School, Hull, UK

Corresponding Author and Address:

Adam McClean

21 Kingsdale Avenue, Ilkley, LS296QL

07583848857

Adam.mcclean1@nhs.net

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Keywords: COVID19; Melanoma; Squamous Cell Carcinoma; Presentation; Diagnosis; Staging

Introduction

The SARS-CoV-2 pandemic has had a substantial impact on the provision of surgical services worldwide[1]. In the United Kingdom, staff redeployment and reduced staffing due to infection and self-isolation has reduced the availability of clinic slots and theatre lists. Additionally, there has been a substantial reduction in the volume of patients presenting to general practice and hospitals during the height of the pandemic[1]. The potential compounded effects of a reduction in referrals along skin cancer pathways and availability of specialist review and intervention has placed patients at risk of delayed investigation, diagnosis, and treatment, and incurred a possibility of adverse outcomes and an increase in morbidity and mortality.[2,3] The aim of this study was to assess the impact of the pandemic upon patients presenting to a speciality skin cancer service.

Methods

This was a single-centre retrospective matched cohort study. All patients diagnosed with cutaneous melanoma or squamous cell carcinoma between April and October 2020 were included and compared to those diagnosed in the same time frame in 2019. Disease specific outcomes included Breslow thickness, Clark's level, pT and TNM staging at presentation. Service outcomes included referral source and time to referral, diagnosis, and treatment. Data analysis techniques are described in supplement 1.

Results

Malignant Melanoma (MM)

There was a 32.1% overall reduction in MM diagnoses in 2020 compared to 2019 (74 vs 109). A summary of results is shown in table 1.

Time from referral to clinic review was not significantly different between the two cohorts. Time from clinic review to biopsy was significantly shorter in 2020 (17.4 days vs 27.1 days, $p = 0.03$), as was time from MDT discussion to subsequent treatment (35.2 days vs 47.3 days, $p<0.01$). Breslow

thickness, TNM and pT staging trended towards an increase in 2020, however none of these achieved statistical significance. There was a significant increase in Clark's level in 2020 ($p < 0.01$).

Squamous Cell Carcinoma (SCC)

There was an overall reduction in SCC diagnoses of 27.7% in 2020 (198 vs 274). A summary of results is shown in table 2.

Time from referral to clinic review was equivocal. There was no significant difference in time from clinic to first procedure (37.29 days vs 35.09 days, p=0.562). Time from procedure to MDT discussion was significantly shorter in 2020 (21.60 days vs 26.50 days, p<0.0001). There was a significant increase in MDT recommendations for further treatment in 2020 (19.5% vs 16.0%, p=0.034). There was a significant increase in tumour, nodal, and metastatic stage at presentation in 2020 when compared to 2019.

In 2020, the proportion of diagnoses originating from primary care was significantly increased (76.5% vs 67.4% p=0.049) and new lesions identified during secondary care follow up decreased (18.0% vs 27.7%). Routine GP referrals were similar across both groups (5.5% vs 5%).

Discussion

The findings of this study demonstrate both successes and concerns in the management of skin cancer during the pandemic. Evidence demonstrates that clinic wait times have reached record levels[4], and while the initial expectation is that this would slow progression through the cancer care pathway, this study demonstrates evidence to the contrary. During the pandemic there was no increase in time between GP referral and specialist clinic review for patients with suspected skin cancer, and once within the hospital pathway patients received accelerated care. This may be due to an increased focus on higher risk cancers. A reduction in histological samples due to reduced theatre workload may have also reduced the wait time for samples to be analysed, thus decreasing time

between surgery and MDT. Additionally, the implementation of “hot” clinics with same day excisions likely further reduced wait times.

Fewer patients were seen overall in the 2020 cohort, potentially reducing the strain on the service, and shortening wait times. This is reflected by a reduction in GP fast track referrals during the pandemic, estimated to be as high as 60% nationally,[5] with a more modest reduction of 19.5% seen in this study. A reduction in primary care referrals suggests the existence of a cohort of patients who have not yet presented to general practice.

This study found a 53.8% reduction in new lesions diagnosed through secondary care follow up. A significant reduction in SCCs identified during follow up appointments demonstrates a possible explanation for part of this missing cohort of patients, with ‘routine’ follow-up cancellations likely leading to missed diagnoses. This same effect was not seen with MM, which may be due to clinical prioritisation, a younger cohort and lower risk of second primary lesions.

This study shows some evidence that patients are presenting at a later stage of disease. MMs demonstrated an increased Clark’s level during the pandemic, with Breslow thickness trending towards an increase. The trend in SCC is more concerning, with significant increases in tumour, nodal, and metastatic stage at presentation. Treatment of metastatic SCC can involve additional surgery, oncology input, and frequent follow up. This, combined with the aforementioned missing cohort of patients, means that the impact of COVID19 on skin cancer services is ongoing, as once standard practice is restored, the service is likely to be faced with an increased patient load, requiring more invasive, time-consuming and costly treatment. We therefore suggest that it would be valuable to continue multi-centre prospective data collection to assist in resource planning.

Conflict of interest statement

None

92 **Ethical Approval**

93 Approval for retrospective data collection obtained via local audit department

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95 **Funding**

96 None

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Demographic	**2019 (n = 109)**	**2020 (n = 74)**	***p* =**
Age (±SD)	64.3 (±16.5)	63.5 (±17.0)	0.769
Gender Female (%) Male (%)	 60 (55%) 49 (45%)	 42 (57%) 32 (43%)	 0.819
Location (%) Head and Neck Upper Limb Lower Limb Trunk	 20 (18.7%) 28 (26.2%) 31 (29%) 18 (26.2%)	 12 (16.2%) 18 (24.3%) 26 (35.1%) 18 (24.3%)	 0.850
Stage			
T Stage (%) T1 T2 T3 T4	 52 (49.1%) 26 (24.4%) 10 (9.4%) 18 (17.0%)	 33 (44.6%) 13 (17.6%) 9 (12.2%) 19 (25.7%)	 0.381

N Stage (%) N0 N1 N2 N3	 94 (88.7%) 8 (7.5%) 3 (2.8%) 1 (0.9%)	 59 (79.7%) 10 (13.5%) 3 (4.1%) 2 (2.7%)	 0.098
M Stage (%) M0 M1	 104 (97.2%) 3 (2.8%)	 72 (97.3%) 2 (2.7%)	 0.967
PT Stage (%) PT1a PT1b PT2a PT2b PT3a PT3b PT4a PT4b	 43 (39.4%) 9 (8.3%) 24 (22.0%) 2 (1.8%) 6 (5.5%) 4 (3.7%) 4 (3.7%) 14 (12.8%)	 21 (28.4%) 12 (16.2%) 10 (13.5%) 3 (4.1%) 4 (5.4%) 5 (6.8%) 6 (8.1%) 13 (17.6%)	 0.168
Measurement			
Lesion Diameter (mm) – Mean (±SD)	13.33 (± 8.88)	13.35 (±8.44)	0.952
Breslow Thickness (mm) – Mean (±SD)	2.3 (±4.1)	3.1 (±3.7)	0.205
Clark's Level (%)			

I II III IV V	0 (0%) 12 (12.2%) 24 (24.5%) 57 (58.2%) 5 (5.1%)	0 (0%) 0 (0%) 22 (31.0%) 39 (54.9%) 10 (14.1%)	<0.01

98 *Table 1: Cutaneous melanoma results summary*

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Demographic	**2019 (n=274)**	**2020 (n=198)**	**P =**
Age (±SD)	80.0 (±9.9)	78.8 (±11.2)	0.234
Gender Female (%) Male (%)	 78 (28%) 204 (72%)	 61 (30%) 139 (70%)	0.498
Stage (%)			
T1 T2 T3 T4	112 (40.9%) 154 (56.2%) 8 (2.9%) 0	137 (69.2%) 31 (15.7%) 30 (15.2%) 0	<0.001
N0 N1 N2	274 (100%) 0 0	195 (98%) 3 (1.5%) 1 (0.5%)	0.026
M0 M1	274 (100%) 0	195 (98%) 4 (2%)	0.03
Measurement			

Lesion Diameter (mm) – Mean (±SD)	17.37 (± 11.42)	16.49 (±10.33)	0.413
Complete Excision (%)	95.8%	94.4%	0.924

Table 2: Squamous cell carcinoma results summary

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STROBE Checklist

Supplementary 1 - data analysis