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1. INTRODUCTION & AIMS

- Reflectance confocal microscopy (RCM) has proven effective for diagnosing melanocytic tumours¹
- Pressure continues to mount on our pigmented lesion services²
- Past studies showed that the majority (64%) of lesions referred to our service in the past were benign with a small number proceeding to biopsy and a fraction of those biopsied turn out to be malignant melanoma (MM)³
- Dermoscopy has reduced the number needed to excise (NNE) to diagnosed one MM in the hands of skilled operators⁴
- We aimed to review the impact RCM was having on our lesion service. It has been primarily used in our centre as an 'add on' test where lesions are equivocal following clinical examination (including dermoscopy), and a further test is desired which heretofore was excision

2. METHODS

- Retrospective observational study of 3 years data of lesions examined by RCM, comparing RCM impression with outcome (histopathology or not excised)
- Pellacani criteria for MM and Lentigo Maligna (LM) were used to interpret images⁶
- Viva scope 1500 and 3000 (handheld device) were used
- 2 consultants with prior training interpreted images

3. RESULTS

- 302 patients' results were analysed. Complete data was available for 223 (74%)
- Most lesions examined were melanocytic (69%) and the most common site recorded was on the head and neck (43%)
- Confocal diagnosis was the same as histological diagnosis in 61% (105/173) of cases, when a lesion was biopsied
- **Outcomes- Excision avoided:** Following RCM, surgery was avoided in 50/223 lesions (22%) RCM diagnosis in this group in order of frequency
 - benign nevus (40%)
 - seborrheic keratosis (SK)/solar lentigo (SL) (28%)
 - scar/recurrence monitoring for previous (LM) (10%)
 - dermatofibroma (4%), congenital nevus (4%) & other (3%)

3. RESULTS

- **Number Needed to Excise (NNE) for one MM:** Of a total of 151 pigmented lesions suspicious for MM, melanoma was suggested in 83 by RCM. Fifty lesions were MM following pathology (calculated reduction of NNE for one melanoma from 3.3 to 1.8)
- Four MMs, although excised following RCM, were misclassified as dysplastic nevi (n=2), one nevus and a Merkle cell carcinoma
- **Head and neck:**
 - Diagnostic concordance was high (77%) where the differential was LM V's solar lentigo
 - Based on RCM 33% of procedures in the head and neck area could have been avoided

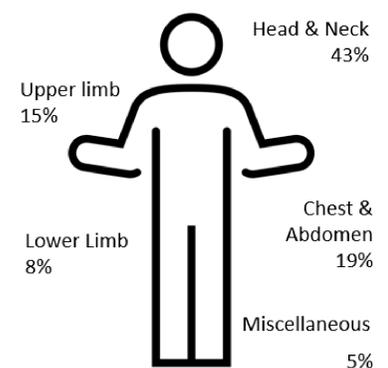
3. RESULTS

Histopathology Diagnosis

Year	2017	2018	2019	
Final diagnosis (histopathology)	N=number			total
Not excised	11	30	9	50
Benign nevus	10	19	8	37
Melanoma (includes MIS*, excludes LM**)	4	12	18	34
Lentigo (solar & benign)	4	12	5	21
Lentigo Maligna**	1	10	5	16
Basal Cell Carcinoma	5	4	1	10
Actinic Keratosis	2	6	2	10
Dysplastic nevus	0	6	1	7
Seborrheic keratosis	2	0	4	6
Dermatofibroma	0	4	1	5
bowens disease, SCCIS	0	1	4	5
Spitz	1	2	1	4
Blue Nevus	0	2	1	3
Lichenoid Keratosis	1	1	0	2
spindle nevus of reed	0	1	1	2
Haemangioma	1	1	1	3
cyst	1	0	2	3
"no malignancy"/not specified	1	2	0	3
Lupus	1	0	0	1
pagets disease	0	0	1	1
	45	113	65	223

*MIS; Melanoma in Situ. ** Lentigo Maligna was analysed separately as it has different RCM criteria for diagnosis to MIS/MM. SCCIS; squamous cell carcinoma in situ

Location of Lesions



CLINICAL EXAMPLES OF RCM

Monitoring of non surgical treatment of LM



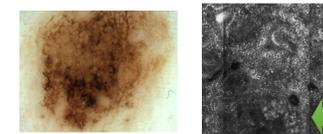
1. 46 year old female with biopsy proven large ill defined LM on a cheek
2. Inflammatory erythema months post imiquimod (60 applications)
3. >Twelve months after treatment, dermoscopy clear
4. RCM at diagnosis: perifollicular dendritic pagetoid melanocytosis (PM) (yellow arrow) in caput medusa orientation. , sheets of PM (green arrow). Irregular architecture
5. Normal facial skin for comparison

RCM examination remains clear (4 years) post treatment at 6 monthly intervals

Diagnosis of melanocytic lesions on chest

Patient 1 Results:

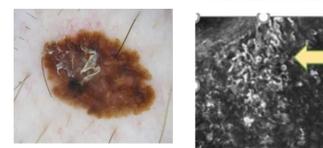
Clinical impression: MIS
RCM impression : benign
Histology: Benign compound nevus



Patient 1: 1st block: Regular cobblestone pattern and packets of nevus cells (green arrow), a benign appearance

Patient 2 Results:

Clinical impression: MM
RCM score: 6/8 suggestive MM
Histology: SSMM, 0.6mm, pT1a



Patient 2: Sheets of Pagetoid Melanocytosis (PM) (yellow arrow) suggestive of MM

Mapping of recurrent Lentigo Maligna

69 year old with LM with +ve margin & previous graft

Mapping:

- Step 1: Mark graft edge
- Step 2: Map at 5 mm margin with hand held device (VS 3000)
- Step 3: Map further where margin +ve i.e. 1-3 o'clock and 6-7 o'clock

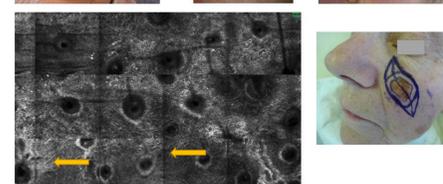
Final clear margin drawn on top right hand image



Diagnosis of melanocytic lesion on face



73 year old, persisting pigmented lesion on cheek. Biopsies 6 years apart consistent with Solar Lentigo



RCM shows widespread perifollicular dendritic pagetoid melanocytosis (arrow) highly suggestive of LM

Final Histology : Lentigo Maligna

4. DISCUSSION & CONCLUSION

- Although not designed for this purpose, this review suggests a reduction in NNE for one melanoma from 3.3 to 1.8 with use of RCM as an add on test to clinical examination with dermoscopy
- It was found to be particularly helpful in the head and neck area where surgical morbidity is high. It can help delineate the extent of LM and thus facilitates preoperative planning and informed consent for surgical treatment
- Dimensions of facial skin is particularly suited due to the maximum penetration depth of RCM and the reflectant nature of melanin in characterising LM and its mimics (SL, Pigmented AKs and seborrheic keratosis)
- A prospective blinded trial of equivocal pigmented lesions is now planned with particular focus on facial lesions
- **Limitations:** retrospective and observational in nature

5. REFERENCES

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