Certificate Course in Primary Care Dermoscopy (3) Dermoscope-guided Surgical Procedures

Antonio An Tung Chuh

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Hong Kong Society of Primary Care Dermoscopy

Disclaimer

Knowledge and the best practice in dermoscopy, dermatology, skin surgery, family medicine, and primary care medicine are constantly changing. As new research broadens our understanding, changes in research methods, practices, or clinical managements may become necessary.

Clinicians must always rely on their knowledge, skills, and experience in evaluating and using any method described in this presentation and the correlated materials. They should also be mindful for their own safety and safety to patients.

To the fullest extent of the law, the author(s) and associated societies of this presentation and correlated materials do not assume liability for any injury to patients as a matter of products liability, negligence, or otherwise, or from any use of ideas contained in this presentation and the correlated materials.

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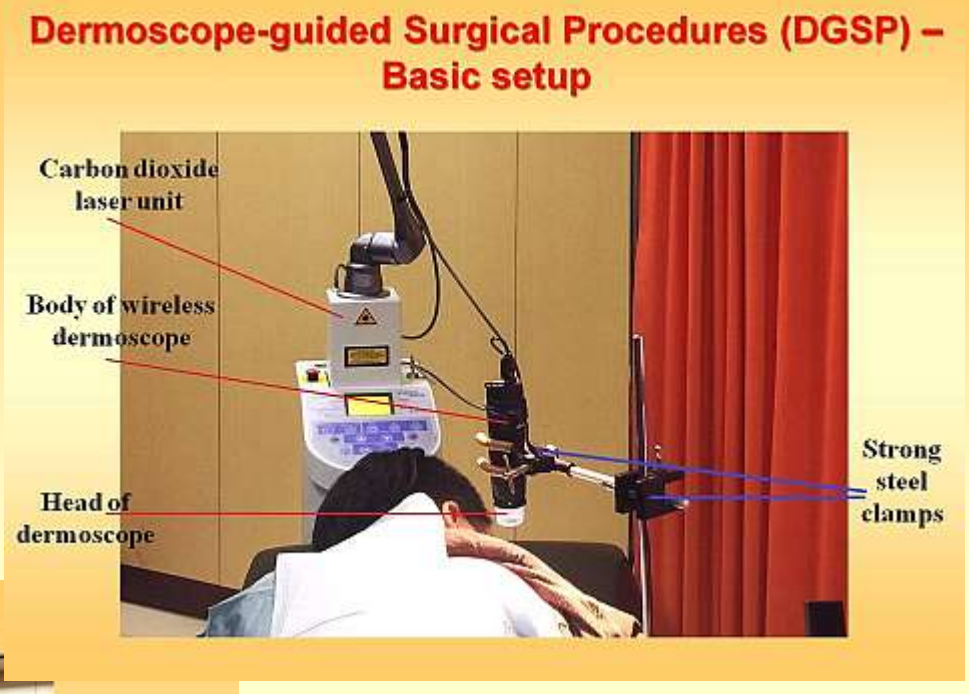
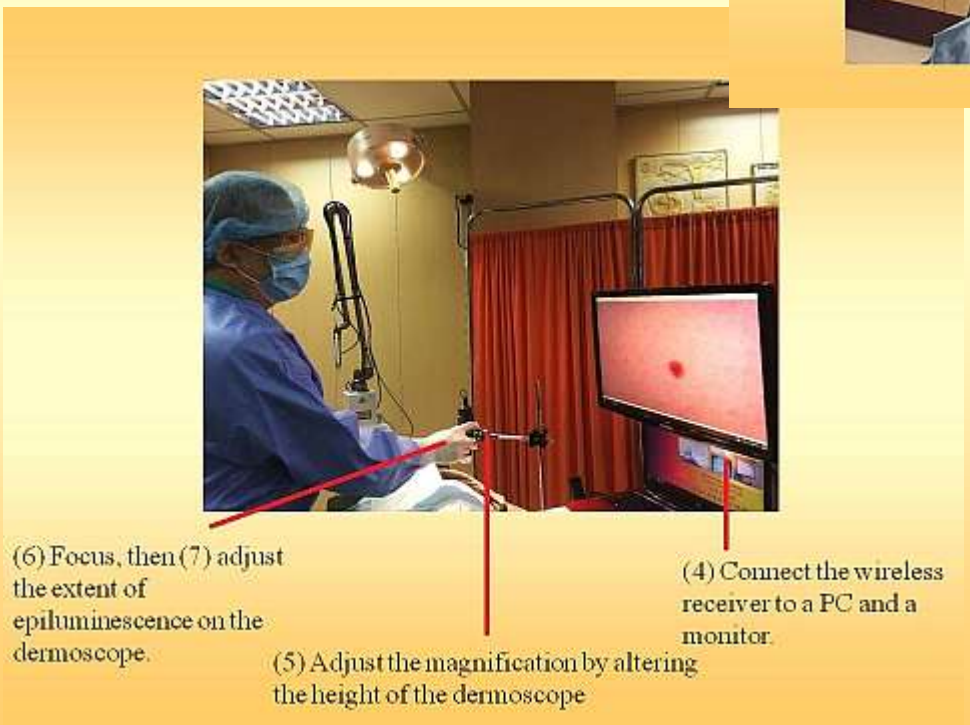
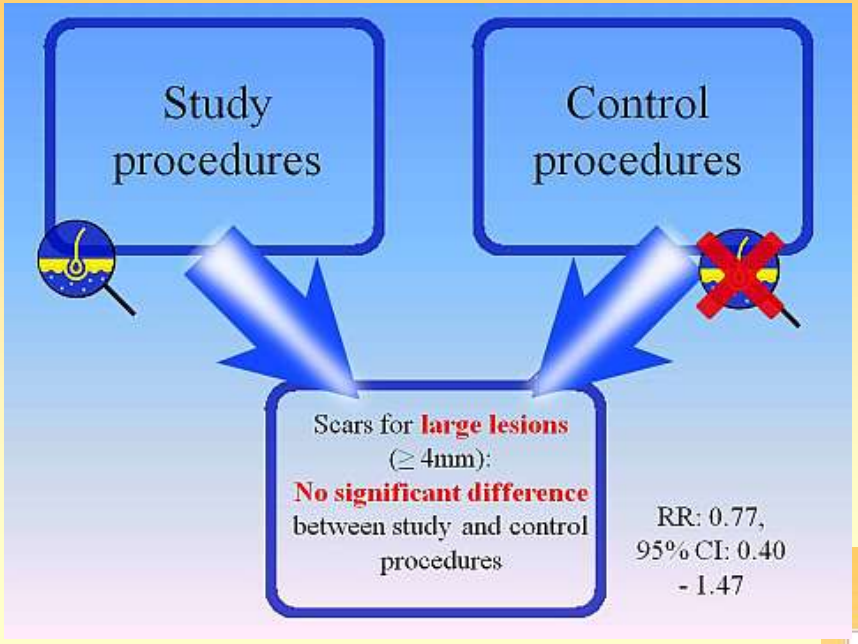
- **Prof Vijay Zawar** (Primary Care and Dermoscopy), Dr Vasantrao Pawar Medical College, India
- **Prof Werner Kempf** (Dermatopathology), University Hospital Zürich, Switzerland

In this presentation, we shall explore:

How we **set up** for dermoscope-guided surgical procedures (DGSP)







And report of a **case-control study** for DGSP,

Control procedures				Study procedures	
More than 20 years of clinical practice	One day	12 months	Six months	Six months	
1996 – 27 Sep 2018	28 Sep 2015	1 Oct 2015 – 30 Sep 2016	1 Oct 2016 – 31 Mar 2017	1 Apr 2017 – 30 Sep 2017	1 Oct 2017 till now
Surgical procedures on skin regularly performed	First DGSP performed	Increasing experience in DGSP	Virtually all skin procedures were DGSP	Virtually all skin procedures were DGSP	

Time line – not to scale

The Royal New Zealand College of General Practitioners
Te Whare Tohu Rata o Aotearoa

ORIGINAL SCIENTIFIC PAPER

Outcomes of dermoscope-guided surgical procedures in primary care: case-control study

Antonio Chuh MD, FRCP, FRCPCH;[1,2,6] Vijay Zawar MD, DNB, DVD, FRCPE;[3] Gabriel Sciallis MD;[4] Regina Fölster-Holst MD[5]

[1] Department of Family Medicine and Primary Care, The University of Hong Kong and Queen Mary Hospital, Pokfulam, Hong Kong
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[3] Department of Dermatology, Dr Vasantrao Pawar Medical College, Nashik, India
[4] Department of Dermatology, Mayo Medical School, Minnesota, USA
[5] Universitätsklinikum Schleswig-Holstein, Campus Kiel, Dermatologie, Venerologie und Allergologie, Germany
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ABSTRACT

INTRODUCTION: No research has been found regarding outcomes of dermoscope-guided surgical procedures in primary care.

AIM: To establish whether outcomes of dermoscope-guided procedures performed in pri-

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A case-control study on the outcomes of dermoscope-guided surgical procedures in primary case settings

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  - **Retrieving the study and control procedures, analyses**
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  - **DG-suturing**
  - **DG-excisional biopsy**
  - **DG-punch biopsy**
- **Possible mechanisms**
- **Comments and future developments**
- **Conclusions**

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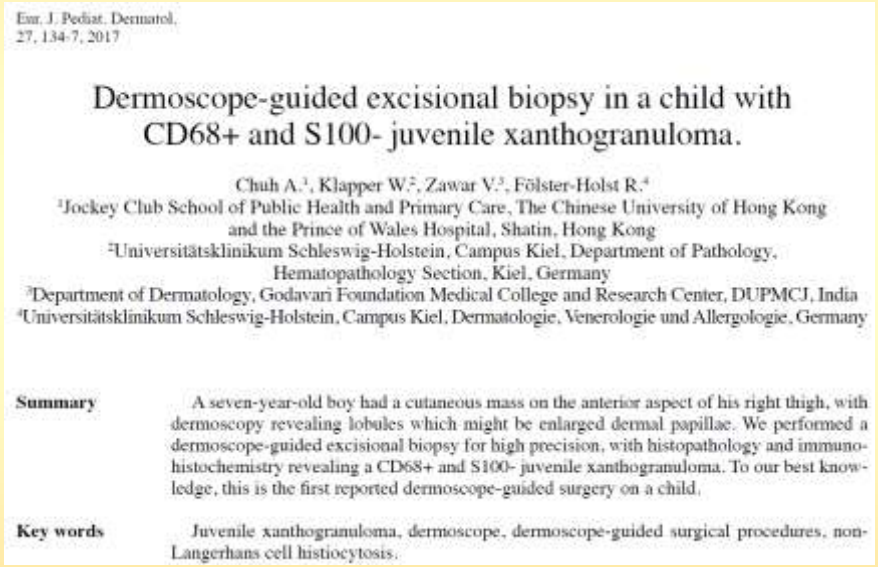
Dermoscope-Guided Surgical Procedures – Background – our previous reports

- We have reported several **dermoscope-guided surgical procedures** (**DGSP**):

- Chuh A, Klapper W, Zawar V, Fölster-Holst R. Dermoscope-guided excisional biopsy in a child with CD68+ and S100- juvenile xanthogranuloma. *Eur J Pediatr Dermatol* 2017; **27**: 134-7.
- Chuh A. Dermoscope-guided suturing for an open wound adjacent to the lacrimal sac and the nasolacrimal duct. *Australas J Dermatol* 2018; **59**:153-4.
- Chuh A, Fölster-Holst R, Zawar V. Dermoscope-guided lesional biopsy to diagnose EMA+ CK7+ CK20+ extramammary Paget's disease with an extensive lesion. *J Eur Acad Dermatol Venereol* 2018; **32**: e92-4.

Dermoscope-Guided Surgical Procedures – Background – our previous reports



Eur. J. Pediat. Dermatol.
27, 134-7, 2017

Dermoscope-guided excisional biopsy in a child with CD68+ and S100- juvenile xanthogranuloma.

Chuh A.[1], Klapper W.[2], Zawar V.[3], Fölster-Holst R.[4]
[1]Jockey Club School of Public Health and Primary Care, The Chinese University of Hong Kong and the Prince of Wales Hospital, Shatin, Hong Kong
[2]Universitätsklinikum Schleswig-Holstein, Campus Kiel, Department of Pathology, Hematopathology Section, Kiel, Germany
[3]Department of Dermatology, Godavari Foundation Medical College and Research Center, DUPMCJ, India
[4]Universitätsklinikum Schleswig-Holstein, Campus Kiel, Dermatologie, Venerologie und Allergologie, Germany

Summary A seven-year-old boy had a cutaneous mass on the anterior aspect of his right thigh, with dermoscopy revealing lobules which might be enlarged dermal papillae. We performed a dermoscope-guided excisional biopsy for high precision, with histopathology and immunohistochemistry revealing a CD68+ and S100- juvenile xanthogranuloma. To our best knowledge, this is the first reported dermoscope-guided surgery on a child.

Key words Juvenile xanthogranuloma, dermoscope, dermoscope-guided surgical procedures, non-Langerhans cell histiocytosis.

DG-excisional biopsy

Chuh A, Fölster-Holst R, Zawar V Double overlapping herald patches in a young child with papular pityriasis rosea – A rare variant of this paraviral exanthem. *Eur J Pediatr Dermatol* 2017; **27**: 71-4.

Dermoscope-Guided Surgical Procedures – Background – our previous reports

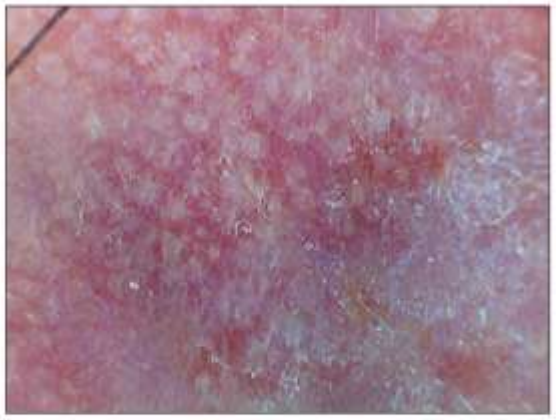


Figure 1 Dermoscopy image at the site selected for lesional biopsy. The reticular pattern should correspond to the exaggeration of rete pegs.[4] The polarization setting corresponded to the depth at around the dermal–epidermal junction. The destruction of the normal dermoscopic appearance corresponded to intraepithelial invasion of tumour cells.

DG-punch biopsy

Chuh A, Fölster-Holst R, Zawar V. Dermoscope-guided lesional biopsy to diagnose EMA+ CK7+ CK20+ extramammary Paget's disease with an extensive lesion. J *Eur Acad Dermatol Venereol* 2018; **32**: e92-4.

Dermoscope-Guided Surgical Procedures – Background – our previous reports

Australasian Journal of Dermatology

Australasian Journal of Dermatology (2017) ••, ••–••

doi: 10.1111/ajd.12710

LETTER TO THE EDITORS

Case Letter

Dear Editor,

Dermatoscope-guided suturing for an open wound adjacent to the lacrimal sac and the nasolacrimal duct

Dermatoscopy is commonly used in dermatological surgery for two purposes; assuring that there was no retained suture,[1,2] and drawing incisions pre-operatively.[3] We report novel procedure of dermatoscope-guided suturing on a wound close to the lacrimal sac, nasolacrimal duct and left eye of an elderly woman.

An elderly woman sustained an accidental fall at home, resulting in open wounds on her face. Studs on her spectacles had pressed into the sidewalls of her nasal bridge. Bleeding was profuse, with significant wound gaps. The wound was 4–5 mm from the lacrimal sac and nasolacrimal duct and 5–8 mm from the left orbit.

There was a risk that unguided or blind suturing might damage the left lacrimal sac or the nasolacrimal duct, causing epiphora. The eye could also be injured while applying the local anaesthetic agent. We therefore proceeded to dermatoscope-guided suturing. This was performed by connecting a dermatoscope to a monitor (Fig. 1). Under ×10 magnification, we ascertained the extent of her wound. We administered 1% lignocaine with adrenalin intradermally through an insulin needle inserted in the medial aspect of the wound. We then used polyamide monofilament with a 19-gauge needle and applied two sutures at the precise sites. Dermatoscopy allowed visualisation of the entire route travelled by the needle from entry to exit point. Figure 2 shows the satisfactory cosmetic outcome on day 21 with no epiphora and no change in visual acuity.

The mechanism of dermatoscope-guided suturing is that if the head of the dermatoscope can be fixed 5–10 cm above the skin of the patient, and if focusing is possible, the area displayed on the screen is wide, allowing guidance by the streaming images.

The authors hereby report a useful, relatively easy method in applying a dermatoscope to the surgical management of wounds.

Antonio Chuh
Jockey Club School of Public Health and Primary Care, Chinese University of Hong Kong and the Prince of Wales Hospital, Shatin, Hong Kong, China

Figure 1 Dermatoscope-guided suturing for a wound. The skin surface was invisible on the monitor screen. The depth of the image (not the depth of focus) was attained by adjusting settings on the levels of cross-polarisation on the dermatoscope. The entire route travelled by the needle was clearly seen and could be easily followed.

Figure 2 At 21 days after the injury most of the wound healing had taken place. The cosmetic results were acceptable.

Conflict of interest: None.

DG-suturing

Chuh A. Dermoscope-guided suturing for an open wound adjacent to the lacrimal sac and the nasolacrimal duct. *Australas J Dermatol* 2018; **59**:153-4.

Dermoscope-Guided Surgical Procedures
Summary of reports by other investigators

Reports	Natures	Limitations
Caresana G, Giardini R. Dermoscopy-guided surgery in basal cell carcinoma. *J Eur Acad Dermatol Venereol* 2010; **24**: 1395-9.	DG-surgery	No control
Bomm L, Benez MD, Maceira JM et al. Biopsy guided by dermoscopy in cutaneous pigmented lesion – case report. *An Bras Dermatol* 2013; **88**: 125-7.	DG-incisional biopsy	One patient only
Miteva M, Tosti A. Dermoscopy guided scalp biopsy in cicatricial alopecia. *Eur Acad Dermatol Venereol* 2013; **27**: 1299-303.	DG-incisional biopsy	No control
Bet DL, Reis AL, Di Chiacchio N, Belda Junior W. Dermoscopy and onychomycosis: guided nail abrasion for mycological samples. *An Bras Dermatol* 2015; **90**: 904-6.	DG-nail abrasion	No control
Cabete J, Lencastre A, João A. Combined use of ex vivo dermoscopy and histopathology for the diagnosis of melanocytic tumors. *Am J Dermatopathol* 2016; **38**: 189-93.	DG-excisional biopsy	Dermoscope performed *ex vivo*
Cervantes J, Miteva M. Distinct trichoscopic features of the sideburns in frontal fibrosing alopecia compared to the frontotemporal scalp. *Skin Appendage Disord* 2018; **4**:50-4.	DG-incisional biopsy	Controls were healthy volunteers, no quantitative analysis

Dermoscope-Guided Surgical Procedures Background – reports by other investigators

- Four studies reported dermoscope-guided procedures, in the context of **Mohs** surgery.

1. Gurgen J, Gatti M. Epiluminescence microscopy (dermoscopy) versus visual inspection during Mohs microscopic surgery of infiltrative basal cell carcinoma. *Dermatol Surg* 2012; **38**: 1066-9.
2. Marchetti MA, Marghoob AA. Dermoscopy. *CMAJ*. 2014; **186**: 1167.
3. Jawed SI, Goldberg LH, Wang SQ. Dermoscopy to identify biopsy sites before Mohs surgery. *Dermatol Surg* 2014; **40**: 334-7.
4. Suzuki HS, Serafini SZ, Sato MS. Utility of dermoscopy for demarcation of surgical margins in Mohs micrographic surgery. *An Bras Dermatol* 2014; **89**: 38-43.

Dermoscope-Guided Surgical Procedures Background – reports by other investigators

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- This is beyond the remits of **primary care**.

1. Gurgen J, Gatti M. Epiluminescence microscopy (dermoscopy) versus visual inspection during Mohs microscopic surgery of infiltrative basal cell carcinoma. *Dermatol Surg* 2012; **38**: 1066-9.
2. Marchetti MA, Marghoob AA. Dermoscopy. *CMAJ*. 2014; **186**: 1167.
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Dermoscope-Guided Surgical Procedures Background

- There thus exists **no case-control study** reported for a range of DGSP in primary care settings.

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- A properly conducted study would establish or refute **efficacies** of this novel approach of dermoscopy.

Dermoscope-Guided Surgical Procedures Background

- There thus exists **no case-control study** reported for a range of DGSP in primary care settings.
- A properly conducted study would establish or refute **efficacies** of this novel approach of dermoscopy.
- Such will also encourage **other investigators** to be engaged in further studies, so as to better the quality of care offered to **patients** with skin diseases.

A case-control study on the outcomes of dermoscope-guided surgical procedures in primary case settings

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Dermoscope-Guided Surgical Procedures Objective

- To investigate outcomes of DGSP in **primary care** settings.

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Dermoscope-Guided Surgical Procedures Setting

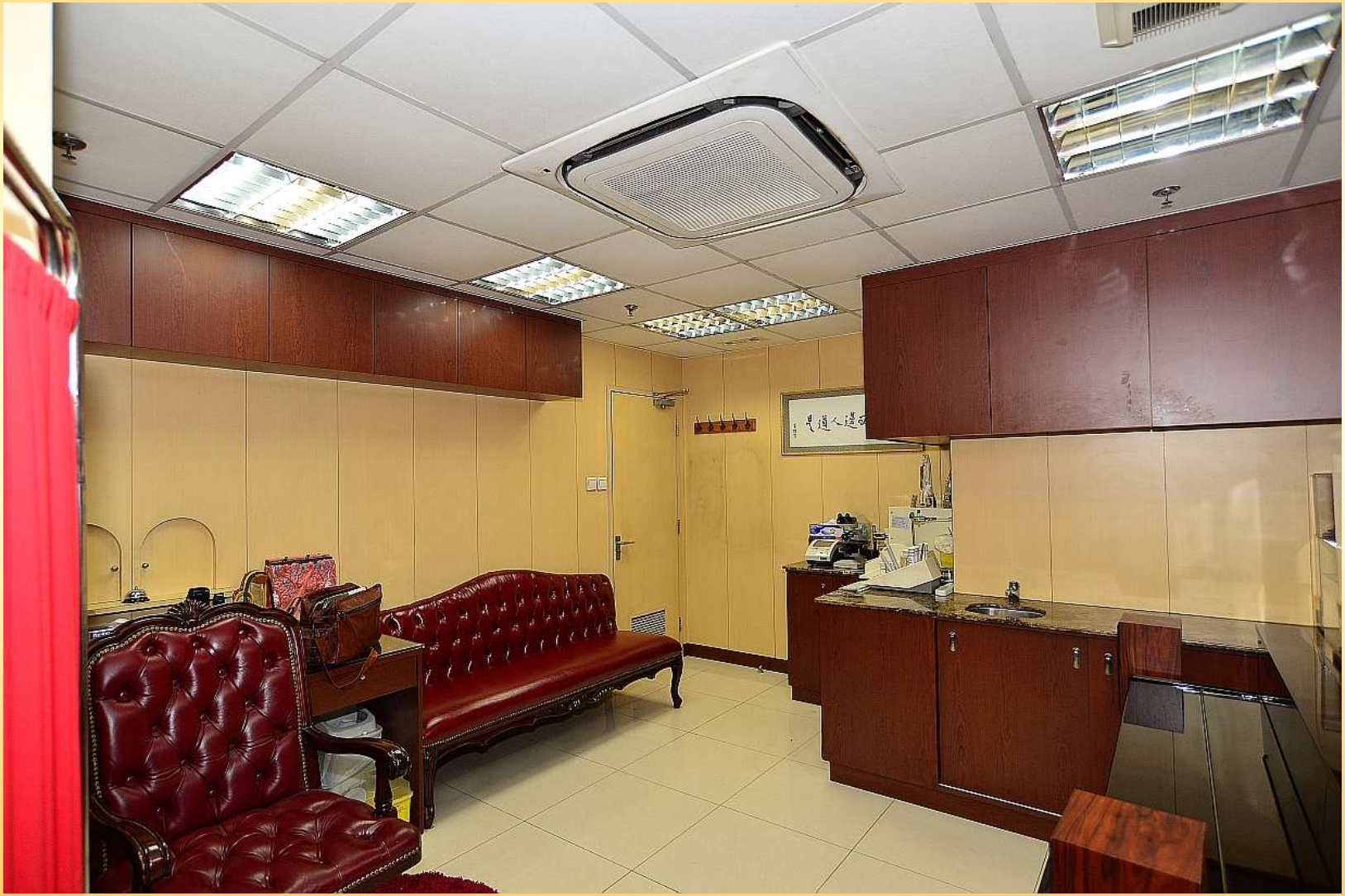
Setting:

- A **primary care** surgery served by one physician with special interests in dermatology and dermoscopy

Dermoscope-Guided Surgical Procedures Setting

Dermoscope-Guided Surgical Procedures Setting

Dermoscope-Guided Surgical Procedures Setting



Dermoscope-Guided Surgical Procedures Setting

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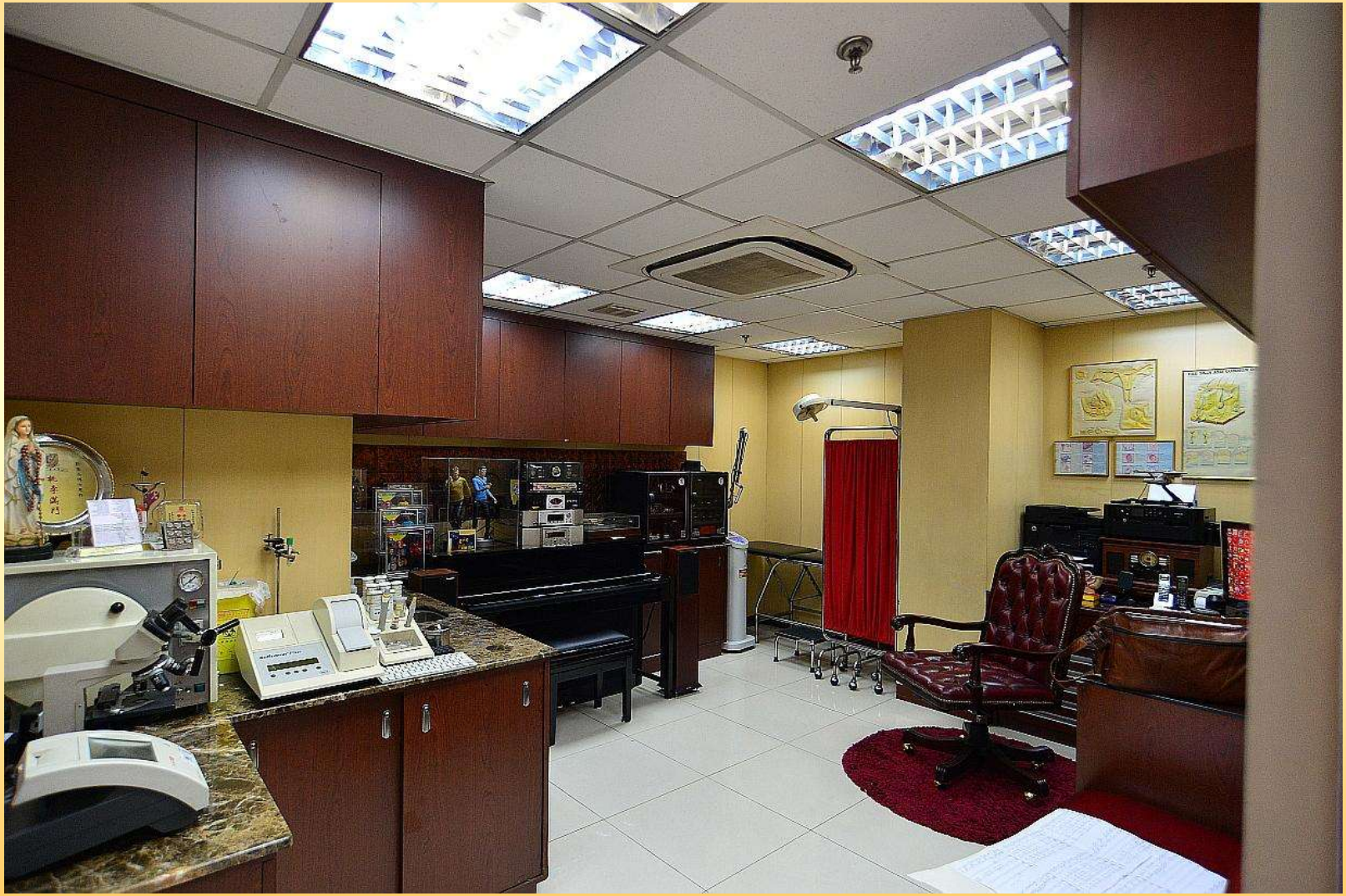
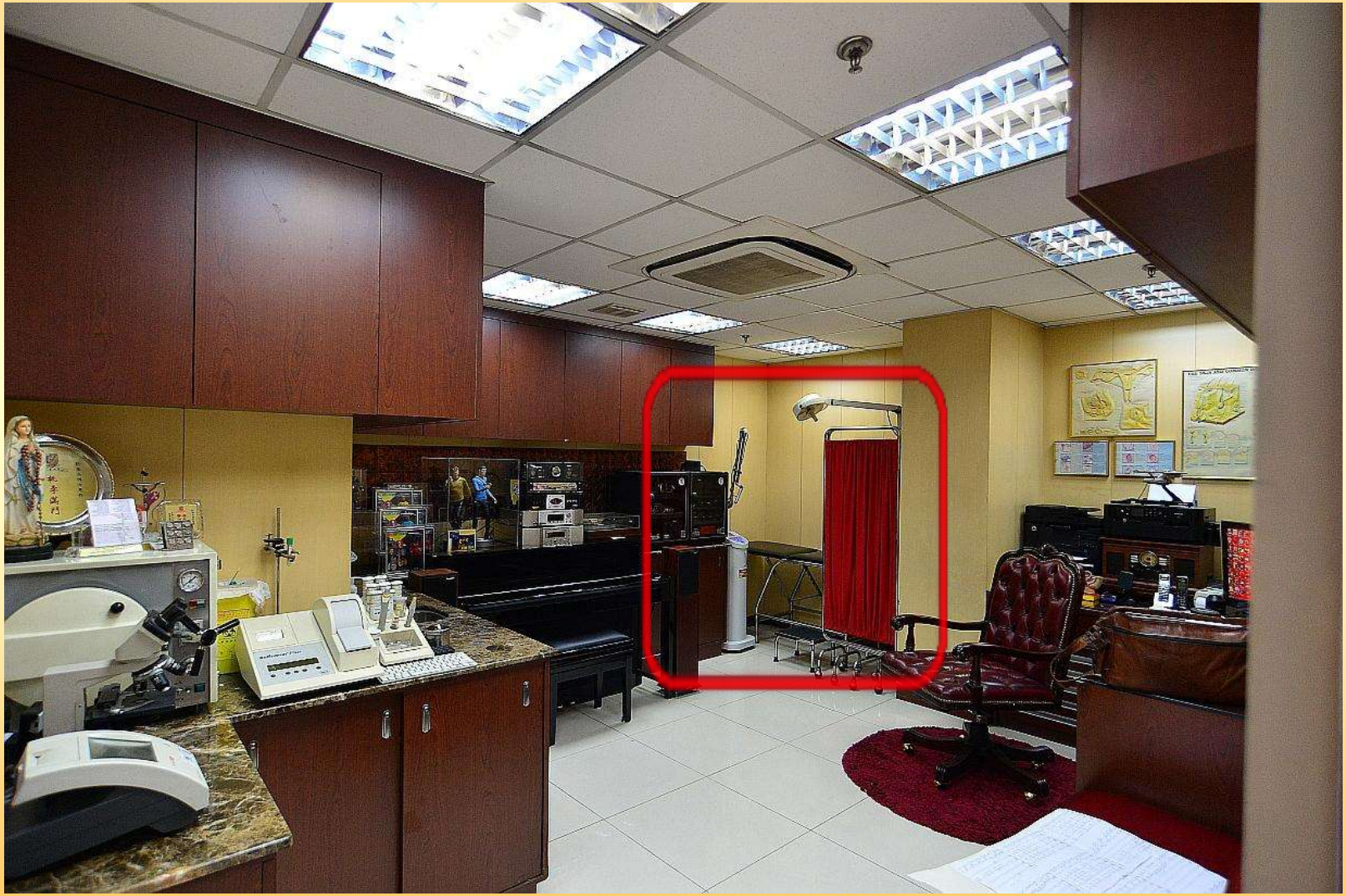


Dermoscope-Guided Surgical Procedures Setting



Chuh A, Zawar V, Folster-Holst R, Lee A. A novel, inexpensive, portable, and wireless dermoscopic unit and qualitative demonstrations on the versatility of the device. Jour of Med Sc & Tech; 6(1); Page No: 8 – 16.

Journal of Medical Science & Technology

Dermatology and Medical Technology

Research Article Open Access

A novel, inexpensive, portable, and wireless dermoscopic unit and qualitative demonstrations on the versatility of the device

Antonio Chuh[1,2], **Vijay Zawar**[3], **Regina Fölster-Holst**[4], **Albert Lee**[2]

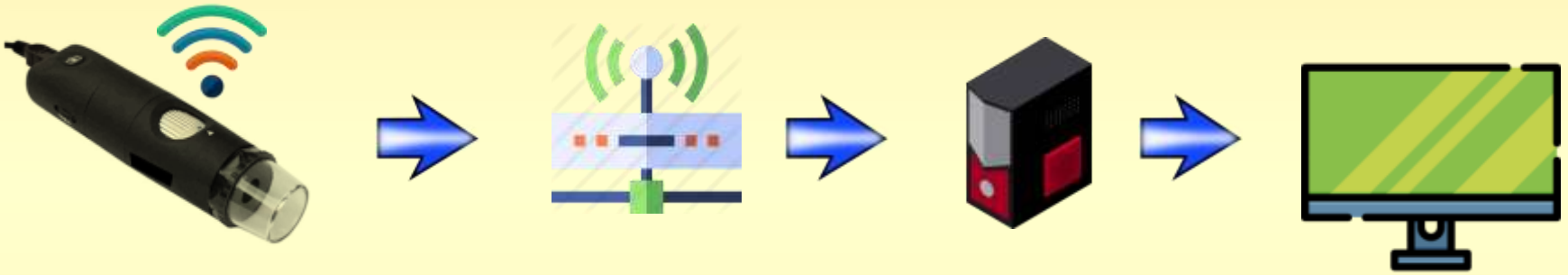
[1]Department of Family Medicine and Primary Care, The University of Hong Kong and Queen Mary Hospital, Pokfulam, Hong Kong
[2]JC School of Public Health and Primary Care, The Chinese University of Hong Kong and Prince of Wales hospital, Shatin, Hong Kong
[3]Department of Dermatology, Godavari Foundation Medical College and Research Center, DUPMCJ, India
[4]Universitätsklinikum Schleswig-Holstein, Campus Kiel, Dermatology, Venerology and Allergology, Germany

Abstract

Dermoscopes are increasingly being applied to non-cancer skin diseases. However, establishing a high-quality, versatile, and inexpensive dermoscopy system could be difficult. We described how we assembled a novel, portable and wireless digital epiluminescence dermoscopic unit. The total cost was around 2,200 USD. If we leave out the unessential components, the total cost would be 1,200 USD only. We present images taken by our unit on the skin, hairs, nails, and capillaries of our patients. The quality of images was adequate. Twelve levels of polarization allowed versatility in viewing different skin depths. Connection to a camera was unnecessary. Images and videos

Chuh A, Zawar V, Fölster-Holst R, Lee A. A novel, inexpensive, portable, and wireless dermoscopic unit and qualitative demonstrations on the versatility of the device. *J Med Sc Tech* 2018; **6**: 8-16.

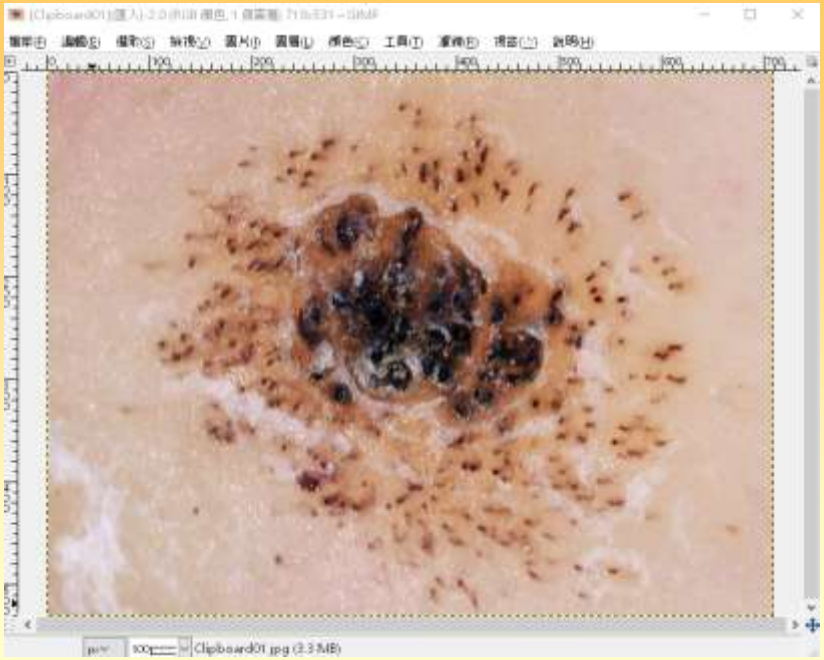
Dermoscope-Guided Surgical Procedures
Flow of data

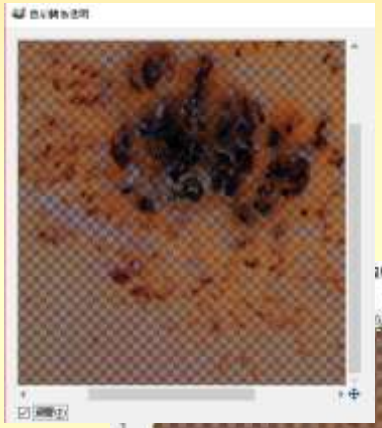


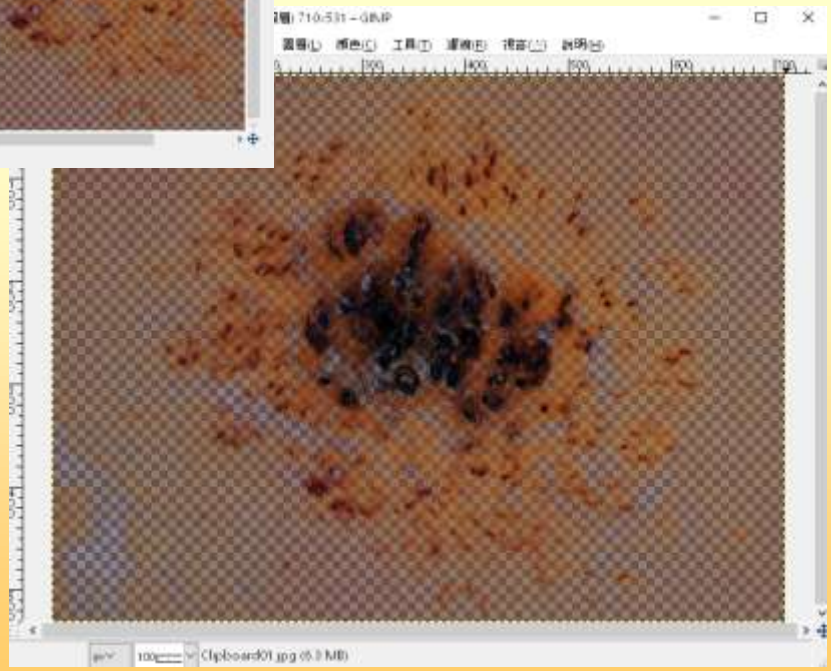
Dermoscope Wireless receiver PC Monitor

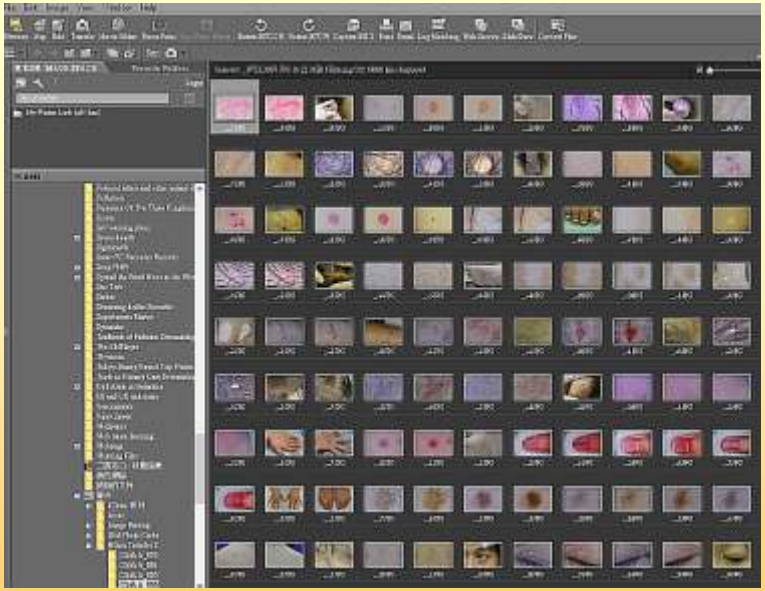
Chuh A, Zawar V, Fölster-Holst R, Lee A. A novel, inexpensive, portable, and wireless dermoscopic unit and qualitative demonstrations on the versatility of the device. *J Med Sc Tech* 2018; **6**: 8-16.

I am used to using **my softwares** for RAW storage, retrieval, and analyses









My clinical and dermoscopic images are securely **linked to my clinical records**.

Clinical images

Corresponding dermoscopic images


Nikon

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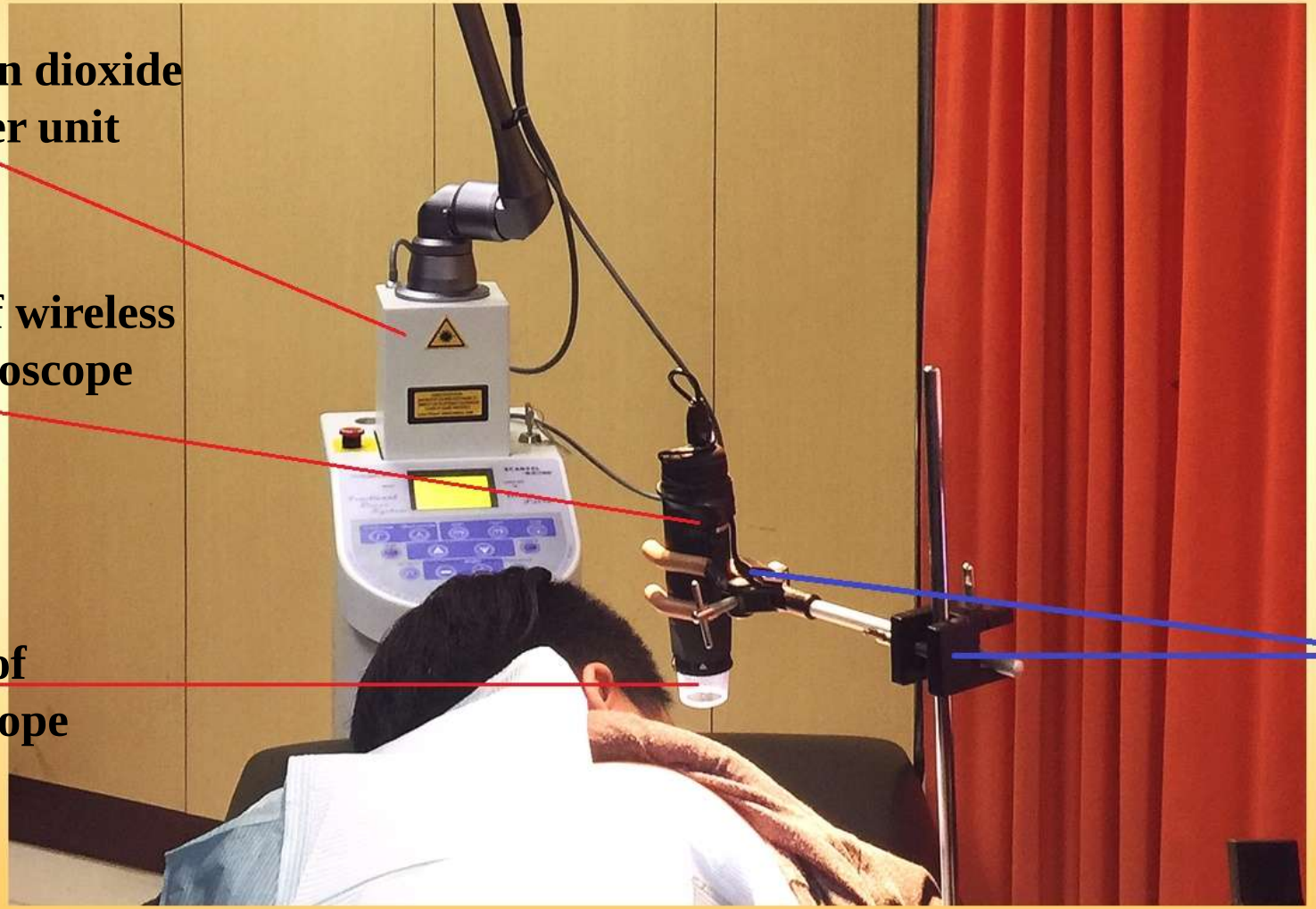
Dermoscope-guided Surgical Procedures (DGSP) – Basic setup



(1) Lie down the patient

(2) Secure the rods

(3) Secure the head of dermoscope, head-down, around 5 cm above surgical field

(6) Focus, then (7) adjust the extent of epiluminescence on the dermoscope.

(5) Adjust the magnification by altering the height of the dermoscope

(4) Connect the wireless receiver to a PC and a monitor.

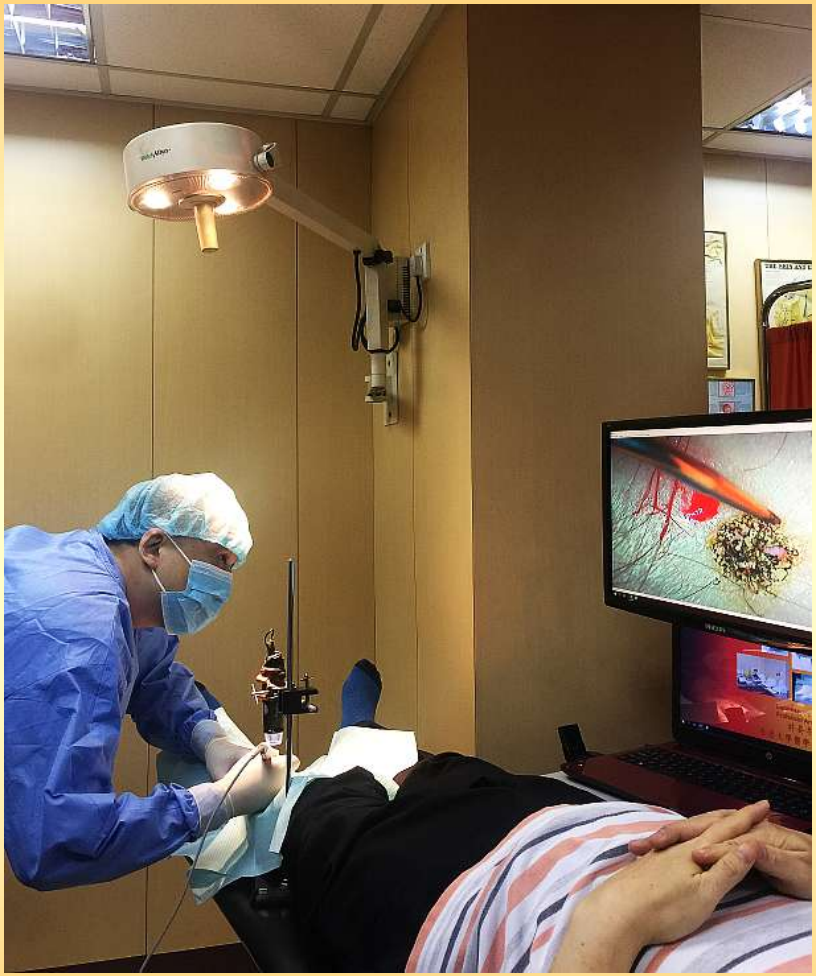
9. The procedure starts, with the clinician looking at the monitor and the surgical field.

8. Set up the laser or other equipments.

Dermoscope-Guided suturing

Chuh A, Klapper W, Zawar V, Fölster-Holst R. Dermoscope-guided excisional biopsy in a child with CD68+ and S100- juvenile xanthogranuloma. *Eur J Pediatr Dermatol* 2017; **27**: 134-7.

Dermoscope-Guided cautery



Chuh A. Roles of epiluminescence dermoscopy beyond the diagnoses of cutaneous malignancies and other skin diseases. *Int J Trop Dis Health* 2017; **24**: 1-10.

Maintenance of **qualities** and **sterility** of all equipments as previously published.

Chuh AAT, Wong WCW, Wong SYS, Lee A. Procedures in primary care dermatology. *Aust Fam Physician* 2005; **34**: 347-51.

Procedures in primary care dermatology

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Samuel YS Wong, MD (Can), CCFP, FRACGP, is Assistant Professor, Department of Community and Family Medicine, The Chinese University of Hong Kong, Prince of Wales Hospital, Shatin, Hong Kong.

Albert Lee, MD (CUHK), FRACGP, FHKCFP, FHKAM, is Professor and Head, Family Medicine, Department of Community and Family Medicine, The Chinese University of Hong Kong, Prince of Wales Hospital, Shatin, Hong Kong.

BACKGROUND

General practitioners can provide a range of diagnostic and treatment procedures for patients with dermatological problems.

Patients with skin diseases commonly present to their family physician. In Australia, 15.1 per 100 encounters in general practice

we reviewed several procedures that we believe GPs will find helpful in the initial evaluation and treatment

Chuh AAT, Wong WCW, Wong SYS, Lee A. Procedures in primary care dermatology. *Aust Fam Physician* 2005; **34**: 347-51.

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Dermoscope-Guided Surgical Procedures Methods

Methods:

- We have been performing surgical procedures on the skin and adjacent tissues for over **20 years**.

Control procedures				Study procedures	
More than 20 years of clinical practice	One day	12 months	Six months	Six months	
1996 – 27 Sep 2018	28 Sep 2015	1 Oct 2015 – 30 Sep 2016	1 Oct 2016 – 31 Mar 2017	1 Apr 2017 – 30 Sep 2017	1 Oct 2017 till now
Surgical procedures on skin regularly performed	First DGSP performed	Increasing experience in DGSP	Virtually all skin procedures were DGSP	Virtually all skin procedures were DGSP	

Time line – not to scale

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All DGSP procedures would be **study procedures**

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For each **study procedure**

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For each **study procedure**

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2. For the same or very **similar** indications

For each **study procedure**

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Each **control procedure** has to be:

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2. For the same or very **similar** indications
3. **Age-and-sex** pair-matched (± five years)

For each **study procedure**

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4. The **most recent** procedure fulfilling 1-3 above

For each **study procedure**

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4. The **most recent** procedure fulfilling 1-3 above

For each **study procedure**

All DGSP performed in 6 months

Controls:

- **Same** or very similar procedures
- Age-and-sex **pair matched**
- **Before** our first DGSP

Study procedures:
No plan for academic pursuits while **performing the procedures**

Control procedures:
No plan for academic pursuits while **performing the procedures**

Study procedures:
No plan for academic pursuits while **assessing outcomes**

Control procedures:
No plan for academic pursuits while **assessing outcomes**

All DGSP performed in 6 months

Controls:

- **Same** or very similar procedures
- Age-and-sex **pair matched**
- **Before** our first DGSP

Primary and secondary outcomes

Dermoscope-Guided Surgical Procedures Methods

Primary outcomes

- **Local inflammation** and infections in two weeks
- **Relapse** in six months
- **Obvious scars** in six months

Dermoscope-Guided Surgical Procedures Methods

- Primary outcomes

- **Local inflammation** and infections in two weeks
- **Relapse** in six months
- **Obvious scars** in six months

- Our secondary outcome
- **Pain** affecting activities of daily living in the first week after the procedure

A case-control study on the outcomes of dermoscope-guided surgical procedures in primary case settings

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Dermoscope-Guided Surgical Procedures Results

Study procedures

- **39 DGSP** performed for 36 patients.
- 21 (58%) were males, 15 (42%) being females.

Dermoscope-Guided Surgical Procedures Results

Study procedures

- **39 DGSP** performed for 36 patients.
- 21 (58%) were males, 15 (42%) being females.
- They aged from seven to 89 years.
- Mean age 48.5 years, SD 20.9 years.

Dermoscope-Guided Surgical Procedures Results

Control procedures

- **Age-and-sex pair matched**
- Age: 11 to 87 years.
- The mean age 49.4 years, SD: 23.2 years.

Dermoscope-Guided Surgical Procedure Results

Control procedures

- **Age-and-sex pair matched**
- Age: 11 to 87 years.
- The mean age 49.4 years, SD: 23.2 years.
- **No** significant difference between patients in the **study-control pairs** (z-score: -0.97; *P* = 0.33).

Results – Types of procedures

Types of procedures	Number of procedures ($N = 36$)
DG - Excisional biopsy	22 (56%)
DG - Suturing	5 (13%)
DG - Laser ablation	5 (13%)
DG - Cautery	5 (13%)
DG - Punch biopsy	2 (5%)

Final diagnoses for DG-excisional biopsies

Final diagnoses	Number of procedures ($N = 22$)
Seborrhoeic keratoses	6
Extra-genital viral warts	3
Fibro-epithelial polyps on scrotal skin	3
Intradermal naevi	2
Benign hyperkeratotic lesion on cheek	1
Compounds naevus	1
Hyperkeratotic lesion on forearm	1
Inverted follicular keratosis on upper back	1
Juvenile xanthogranuloma on thigh	1
Neurofibroma on forearm	1
Squamous papilloma on cheek	1
Tumoural calcinosis on scrotal skin	1

Indications for DG-suturing

Indications	Number of dermoscope- guided suturing ($N = 5$)
Open wound lateral to **lateral angle of right eye** due to accidental fall with injured region hit against angle of a wooden chair	1
Open wound on lateral aspect of **left wrist**, adjacent to tendons of extensor pollicis brevis and abductor pollicis longus.	1
Open wound on **upper lip** after accidental fall injury	1
Open wounds on both sides of **nasal bridge** after accidental fall, adjacent to the left lacrimal sac and nasolacrimal duct.	1
Self-inflicted wound to ventral aspect of **left wrist**	1

Indications for DG-laser ablation

Indications	Number of dermoscope- guided laser ablation ($N = 5$)
Extragenital viral warts	3
Molluscum contagiosum on shaft of penis	1
Melanocytic naevus on shoulder, no dermoscopic evidence of skin cancers	1

Indications for DG-cauteries

Indications	Number of dermoscope-guided cautery ($N = 5$)
Extra-genital viral warts	3
Acrochordons on neck	2

Study procedures

Control procedures

Acute complications: Insignificant differences

Study procedures

Control procedures

Incomplete removal/relapse in 6 months:

Study procedures significantly better

RR:0.22, 95% CI: 0.05-0.95

Study procedures

Control procedures

Obvious scars:
Study procedures significantly better

RR: 0.52, 95% CI: 0.32 - 0.83

Study procedures

Control procedures

Scars for **small lesions** (< 4mm):

Study procedures significantly better

RR: 0.30, 95% CI: 0.13 - 0.67

Study procedures

Control procedures

Scars for **large lesions** (≥ 4mm):
No significant difference between study and control procedures

RR: 0.77, 95% CI: 0.40 - 1.47

Study procedures

Control procedures

Pain affecting activities of daily living: Insignificant difference

RR: 1.20, 95% CI: 0.40 - 3.58

Dermoscope-Guided Surgical Procedures Summary of significant results

DGSP was **significantly** better for

- **Complete removal of lesions**
- **Scarring at six months**, especially for lesions < 4mm

Dermoscope-Guided Surgical Procedures
Summary of significant results

DGSP was significantly better for

- **Complete removal of lesions**
- **Scarring at six months**, especially for lesions < 4mm

Insignificant differences for

- Acute complications
- Scarring at six months for lesions ≥ 4mm
- Pain

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Dermoscope-Guided Surgical Procedures
DG-suturing

- Elderly lady sustained accidental **fall**, studs of **spectacles** pressed into the side walls of **nasal bridge**

Dermoscope-Guided Surgical Procedures
DG-suturing

- Elderly lady sustained accidental **fall**, studs of **spectacles** pressed into the side walls of **nasal bridge**
- **Wide gapping** wounds (yellow arrows)

Dermoscope-Guided Surgical Procedures
DG-suturing

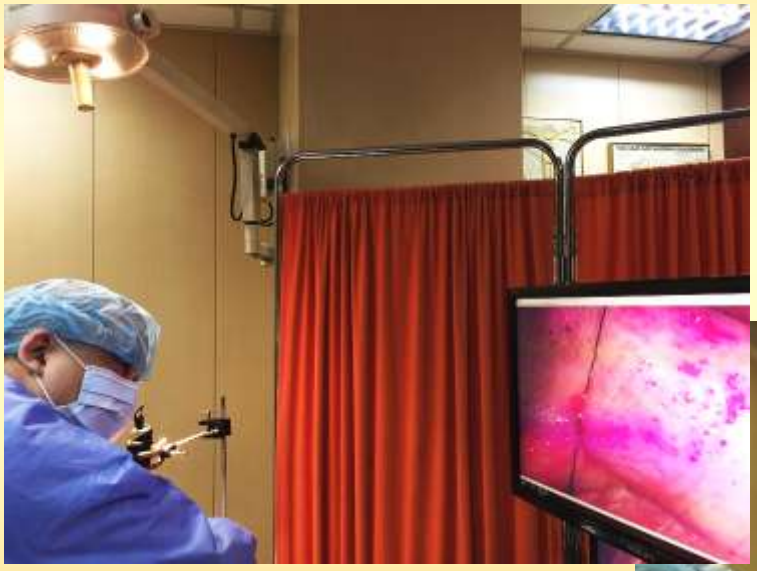
- Elderly lady sustained accidental **fall**, studs of **spectacles** pressed into the side walls of **nasal bridge**
- **Wide gapping** wounds (yellow arrows)
- Wounds adjacent to left **lacrimal sac** and **nasal-lacrimal duct**

Dermoscope-Guided Surgical Procedures
DG-suturing

- Elderly lady sustained accidental **fall**, studs of **spectacles** pressed into the side walls of **nasal bridge**
- **Wide gapping** wounds (yellow arrows)
- Wounds adjacent to left **lacrimal sac** and **nasal-lacrimal duct**
- ***Blind* suturing** might lead to **epiphora**

Dermoscope-Guided Surgical Procedures
DG-suturing

We performed **DG-suturing**.



Dermoscope-Guided Surgical Procedures
DG-suturing

Day 3

Dermoscope-Guided Surgical Procedures
DG-suturing

Day 45

Dermoscope-Guided Surgical Procedures
DG-suturing

Day 45

Dermoscope-Guided Surgical Procedures
DG-suturing

Day 62

Dermoscope-Guided Surgical Procedures
DG-suturing

Day 62

Virtually **no scar**

Left-right **symmetry** attained.

Dermoscope-Guided Surgical Procedures
DG-suturing

Day 62

Virtually **no scar**

Left-right **symmetry** attained.

A successful application of **dermoscope-guided suturing**.

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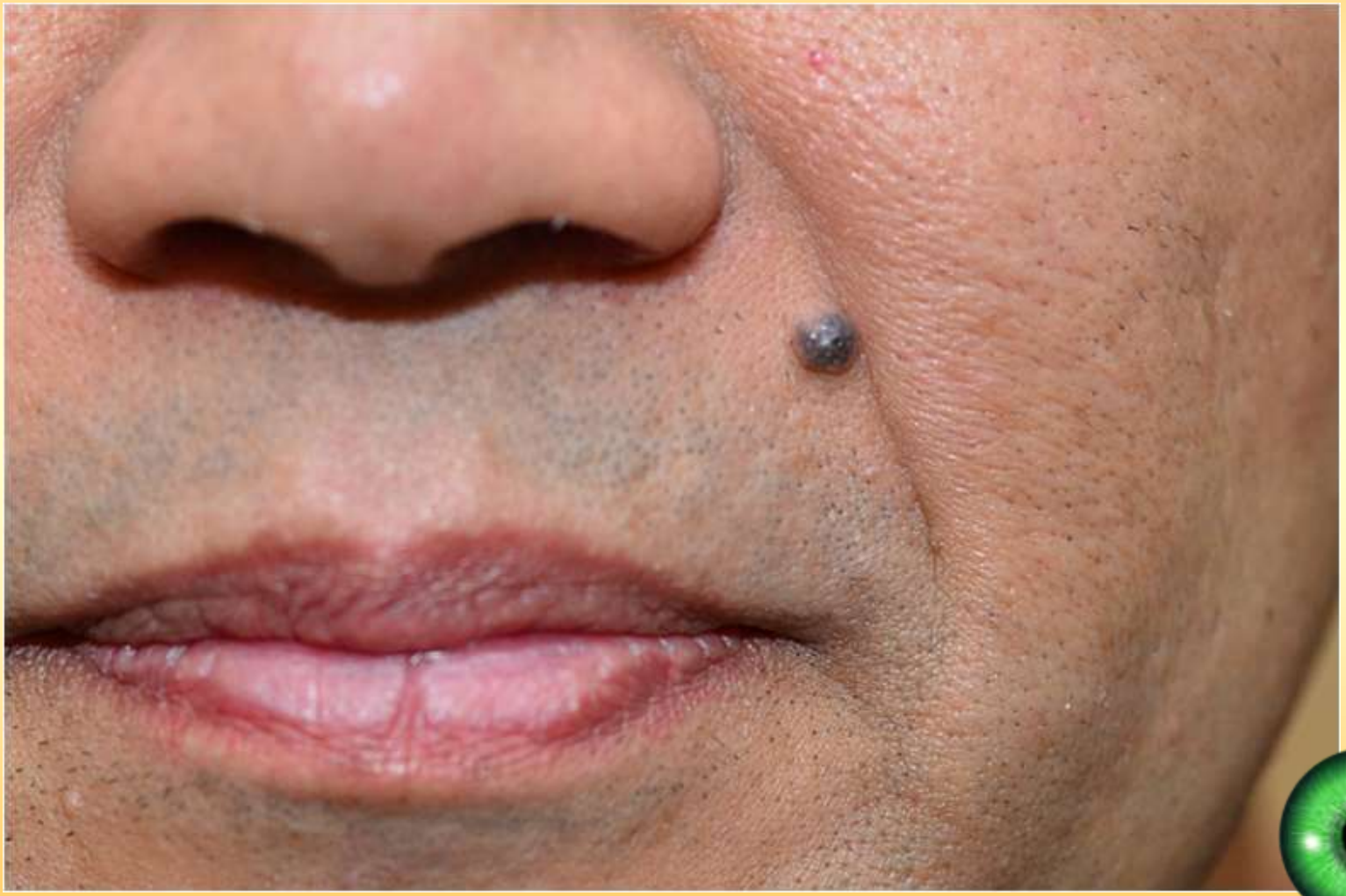
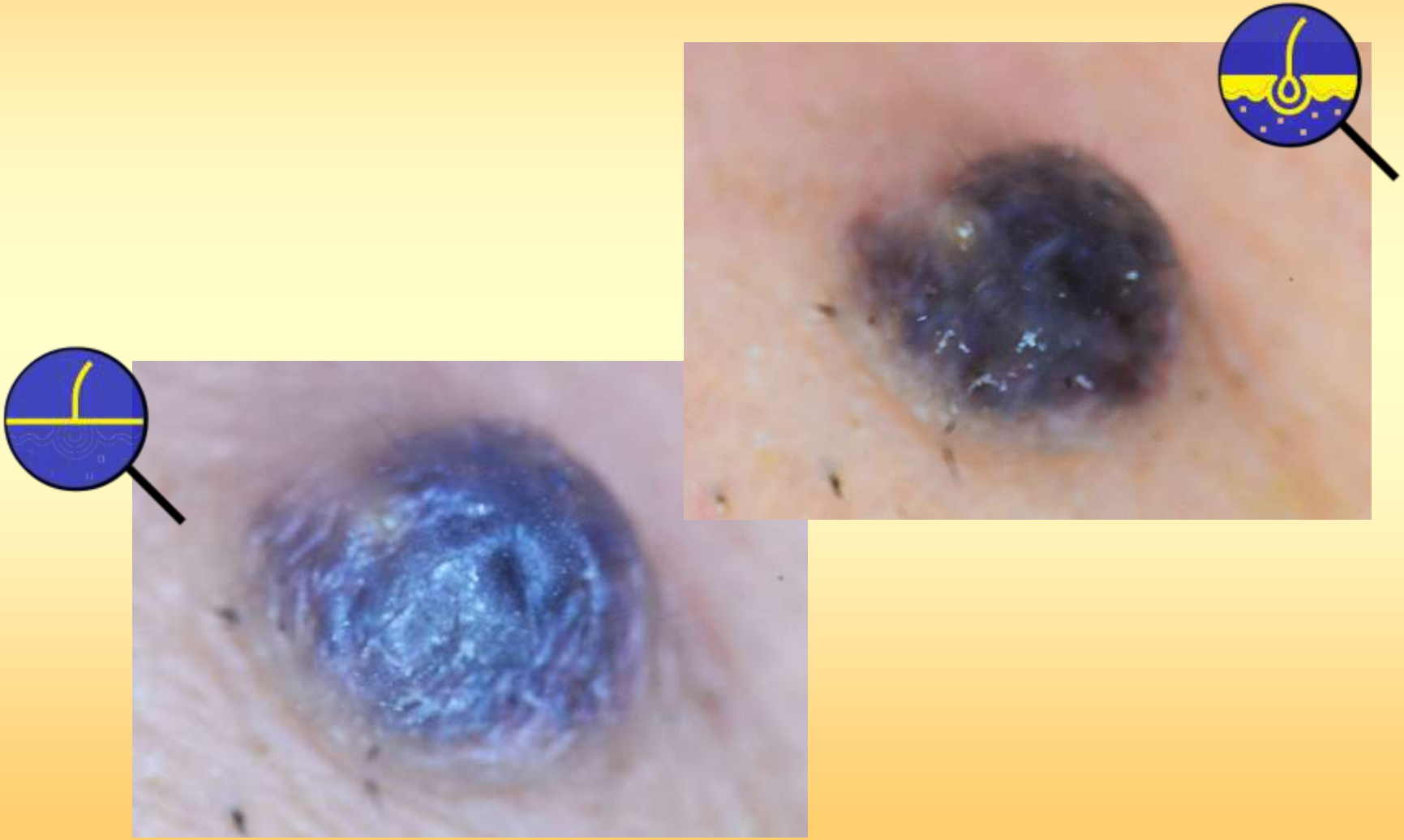
Dermoscope-Guided Surgical Procedures
DG-excisional biopsy



Dermoscope-Guided Surgical Procedures
DG-excisional biopsy



Dermoscope-Guided Surgical Procedures
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Dermoscope-Guided Surgical Procedures
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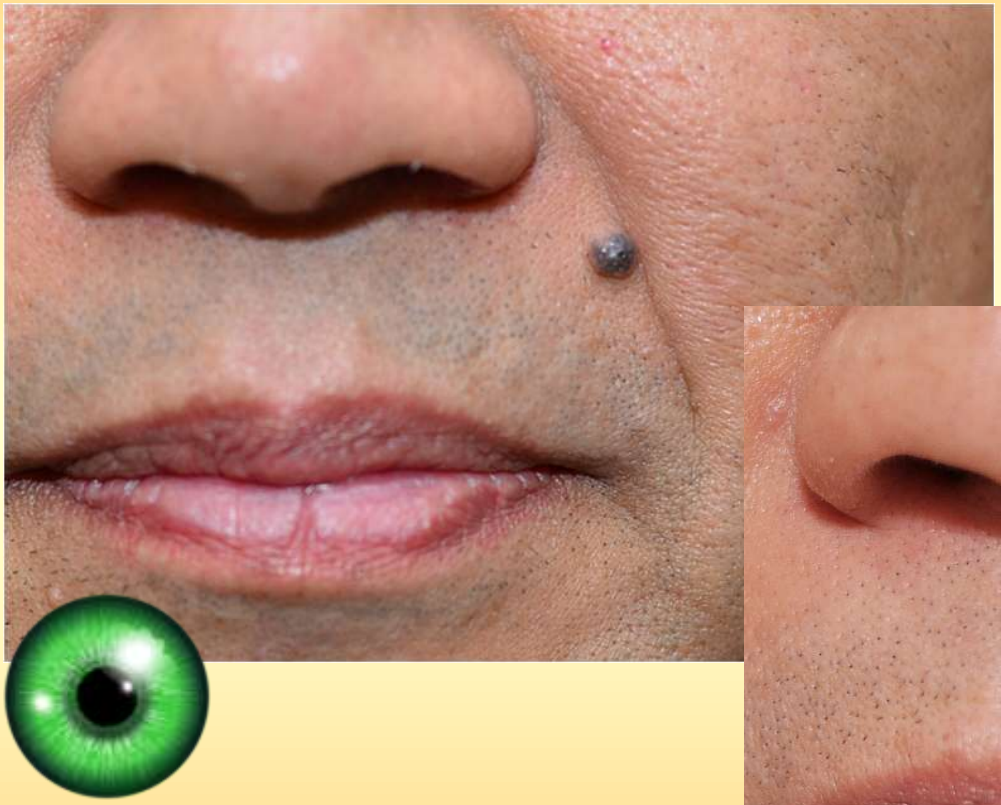

Juvenile xanthogranuloma

- A type of **non-Langerhan's cell histiocytosis**
- Caucasian more likely
- 20% seen at birth
- Commonest in **infants** and **early childhood**
- Some may disappear spontaneously.

Juvenile xanthogranuloma

Juvenile xanthogranuloma

Dermoscopic features do **not** suggest the most likely **diagnosis**.

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Sticky spot present – malignancy possible.

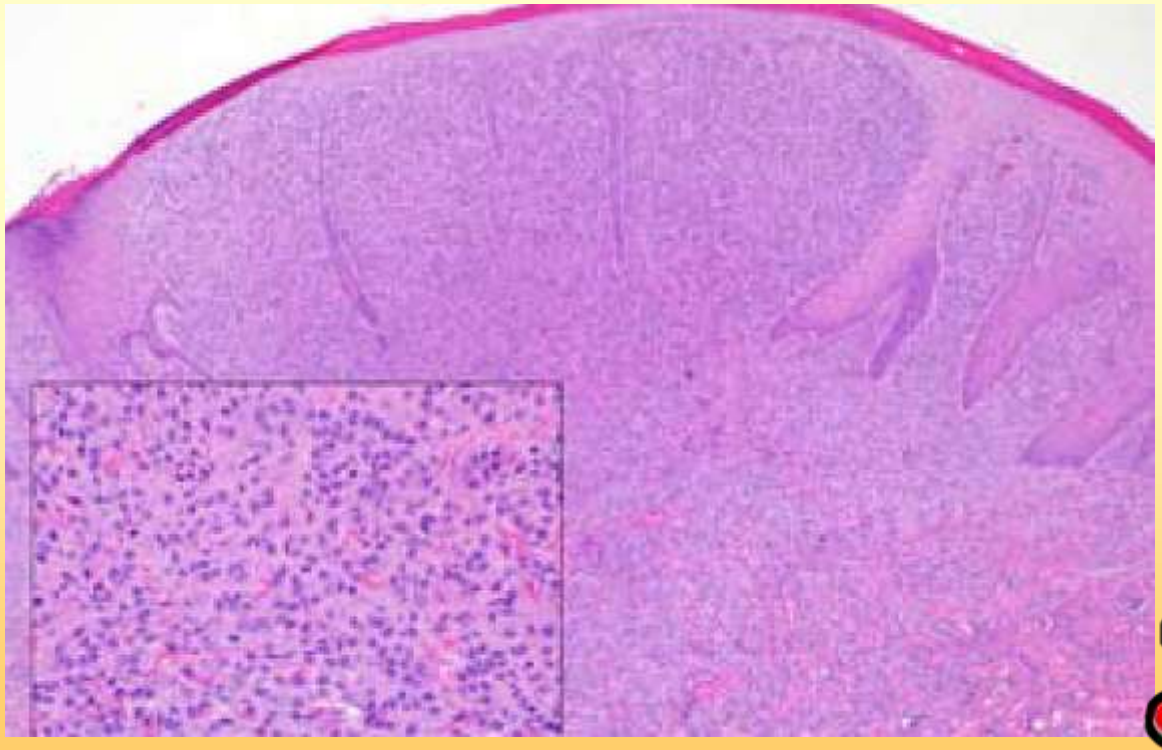
Dermoscopic features do **not** suggest the most likely **diagnosis**.

Sticky spot present – **malignancy** possible.

Dermoscope-guided excisional biopsy performed.

Juvenile xanthogranuloma

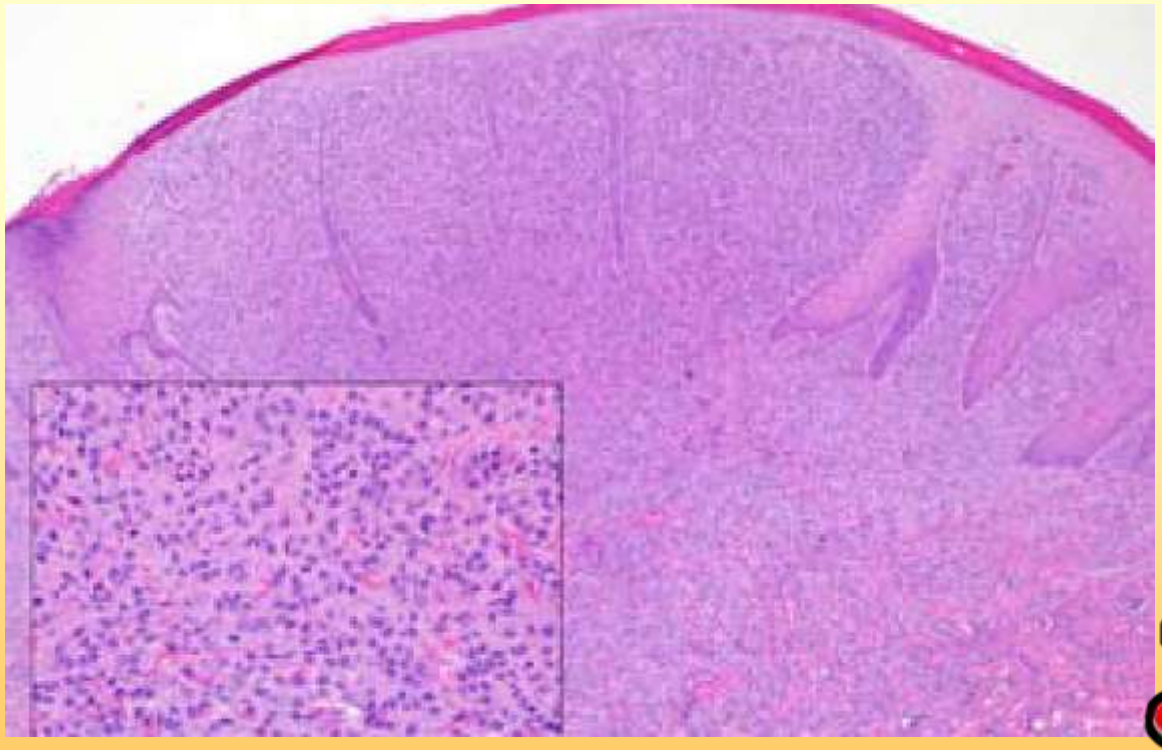
Results: Lesion **completely removed** upon dermoscope guidance.



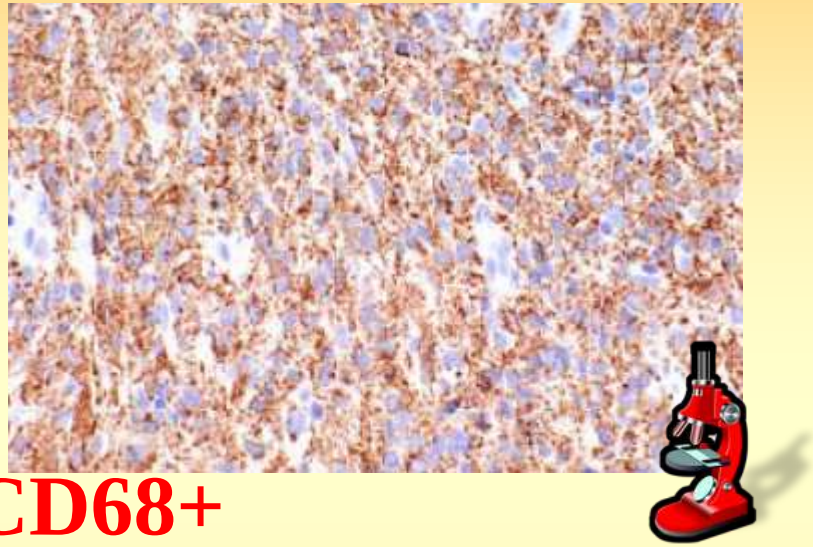
Juvenile xanthogranuloma

Results: Lesion **completely removed** upon dermoscope guidance.

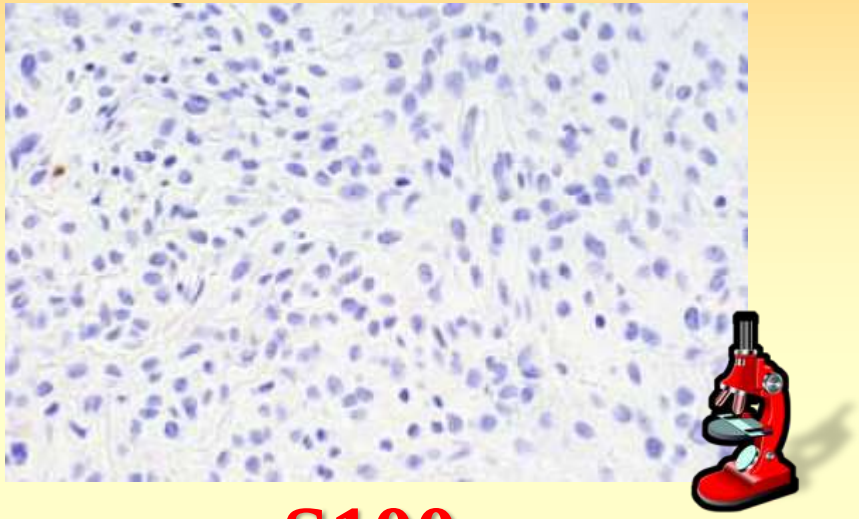
Sharply demarcated nodule composed of **histiocytic cells** with pale cytoplasm (H&E, 20X; insert: 400X)



Juvenile xanthogranuloma



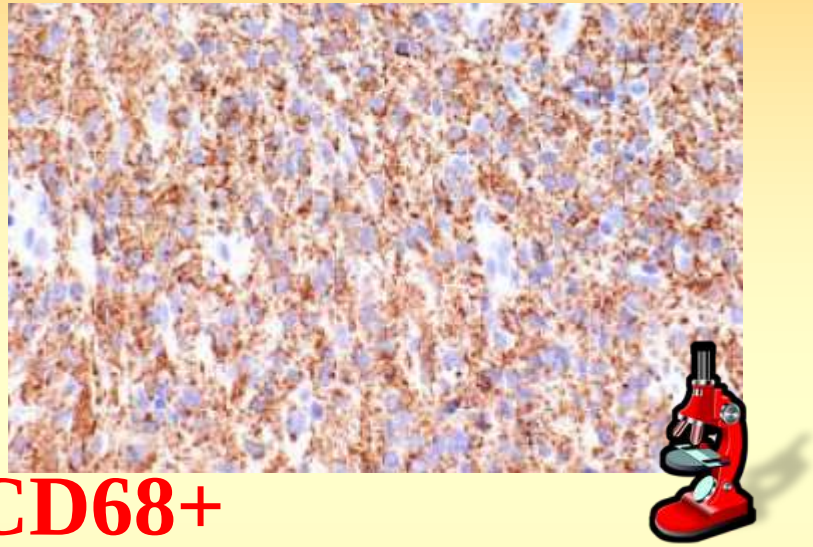
CD68+



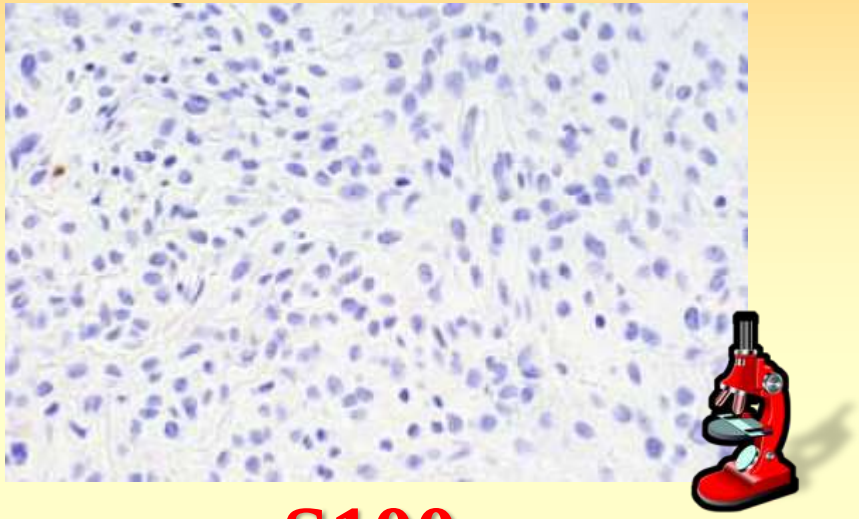
S100-

Immunohistochemical staining substantiates the diagnosis of juvenile xanthogranuloma.

Juvenile xanthogranuloma



CD68+



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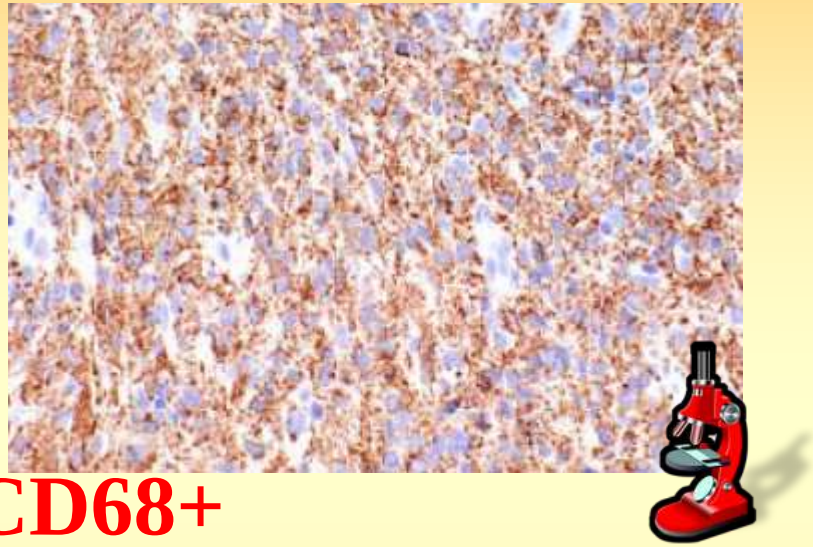
Clinical outcomes: **Acceptable scar**. **No relapse** in two years.

Juvenile xanthogranuloma



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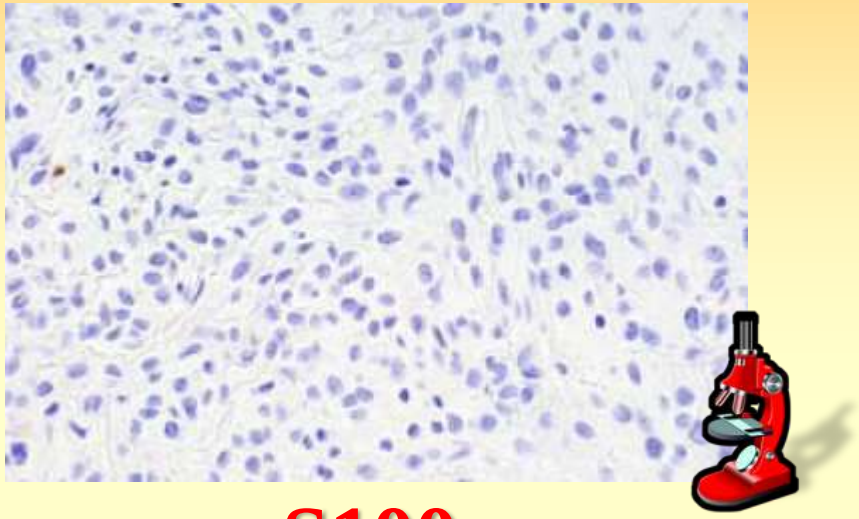

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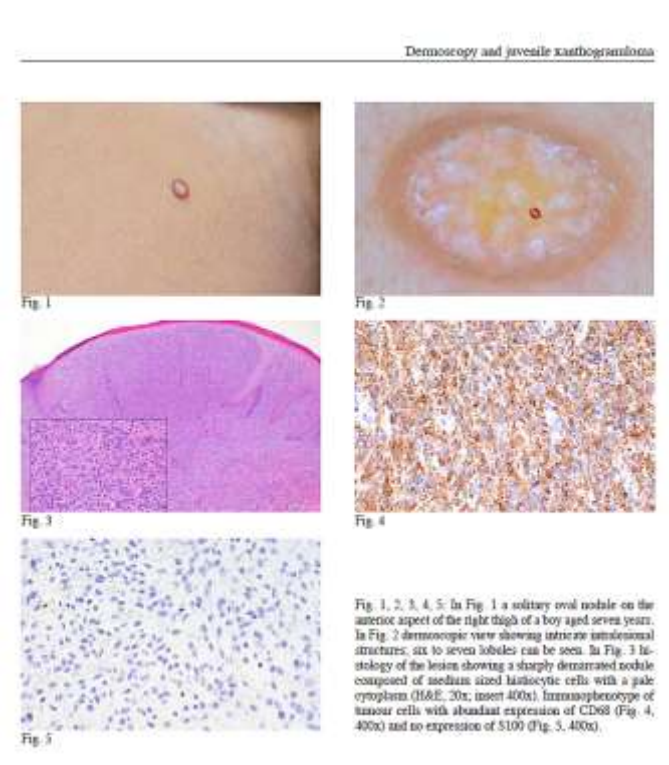

Chuh A, Klapper W, Zawar V, Fölster-Holst R. Dermoscope-guided excisional biopsy in a child with CD68+ and S100- juvenile xanthogranuloma. *Eur J Pediatr Dermatol* 2017; **27**: 134-7.

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Dermoscope-guided punch biopsy – Extra-mammary Paget's Disease

- Paget's Disease – cancer on breasts similar to dermatitis
- **Paget cells** – large cells with clear cytoplasm (clear halo)
- Extra-mammary Paget's Disease – rare and slow-growing
- Initially in **apocrine regions**
- 40% near **scrotal regions**

Dermoscope-guided punch biopsy – Extra-mammary Paget's Disease

Indurated lesion extending from the **left inguinal crease** to the left-lateral aspect of the **scrotal wall**, the root of **penis** and the **left thigh**.

Dermoscope-guided punch biopsy – Extra-mammary Paget's Disease

Indurated lesion extending from the **left inguinal crease** to the left-lateral aspect of the **scrotal wall**, the root of **penis** and the **left thigh**.

Apart from elevated acute phase reactants. investigations our **in-house laboratory** and other reference laboratories revealed **non-specific findings**

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Apart from elevated acute phase reactants. investigations our **in-house laboratory** and other reference laboratories revealed **non-specific findings**

The patient did not have means to manage further in the private sector. However, without a **histopathology diagnosis**, the patient would endure a long waiting time in the public medical system.

Dermoscope-guided punch biopsy – Extra-mammary Paget's Disease

Indurated lesion extending from the **left inguinal crease** to the left-lateral aspect of the **scrotal wall**, the root of **penis** and the **left thigh**.

Apart from elevated acute phase reactants. investigations our **in-house laboratory** and other reference laboratories revealed **non-specific findings**

The patient did not have means to manage further in the private sector. However, without a **histopathology diagnosis**, the patient would endure a long waiting time in the public medical system.

Moreover, he could not afford **multiple biopsies**.

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Dermoscope-guided punch biopsy – Extra-mammary Paget's Disease

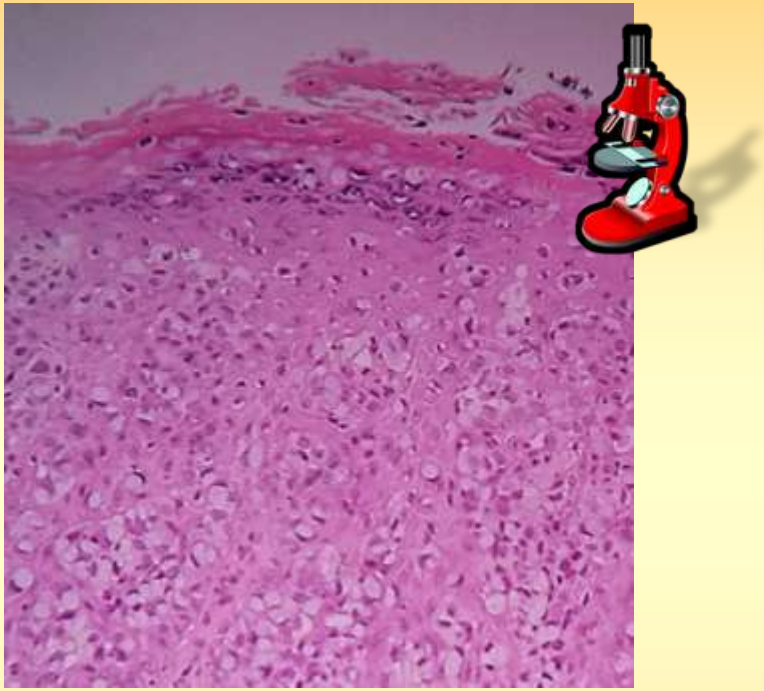
Dermoscopy revealed the site with **most induration** and **most tissue damage**.

Dermoscope-guided punch biopsy – Extra-mammary Paget's Disease

Dermoscopy revealed the site with **most induration** and **most tissue damage**.

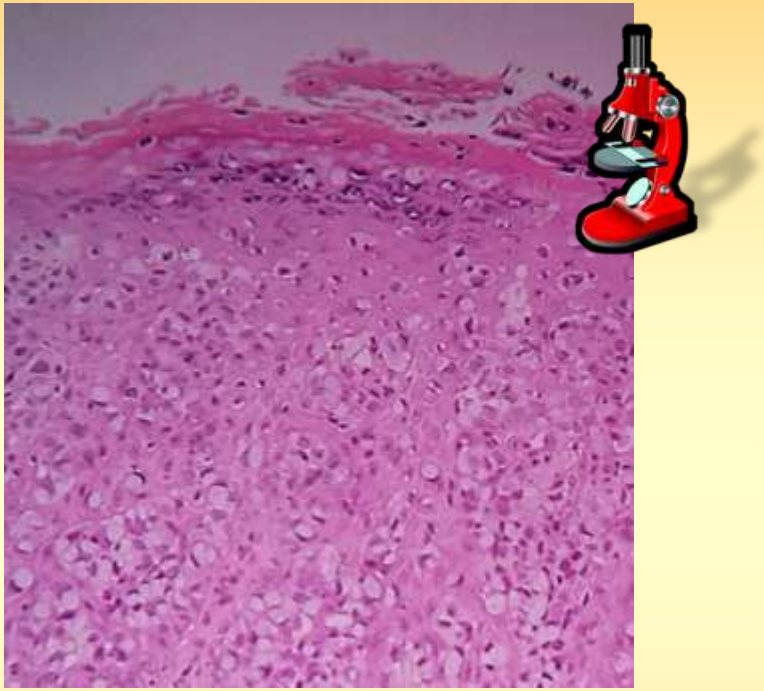
Biopsy taken there.

Dermoscope-guided punch biopsy – Extra-mammary Paget's Disease



Staged operations by the surgeons.

Dermoscope-guided punch biopsy – Extra-mammary Paget's Disease



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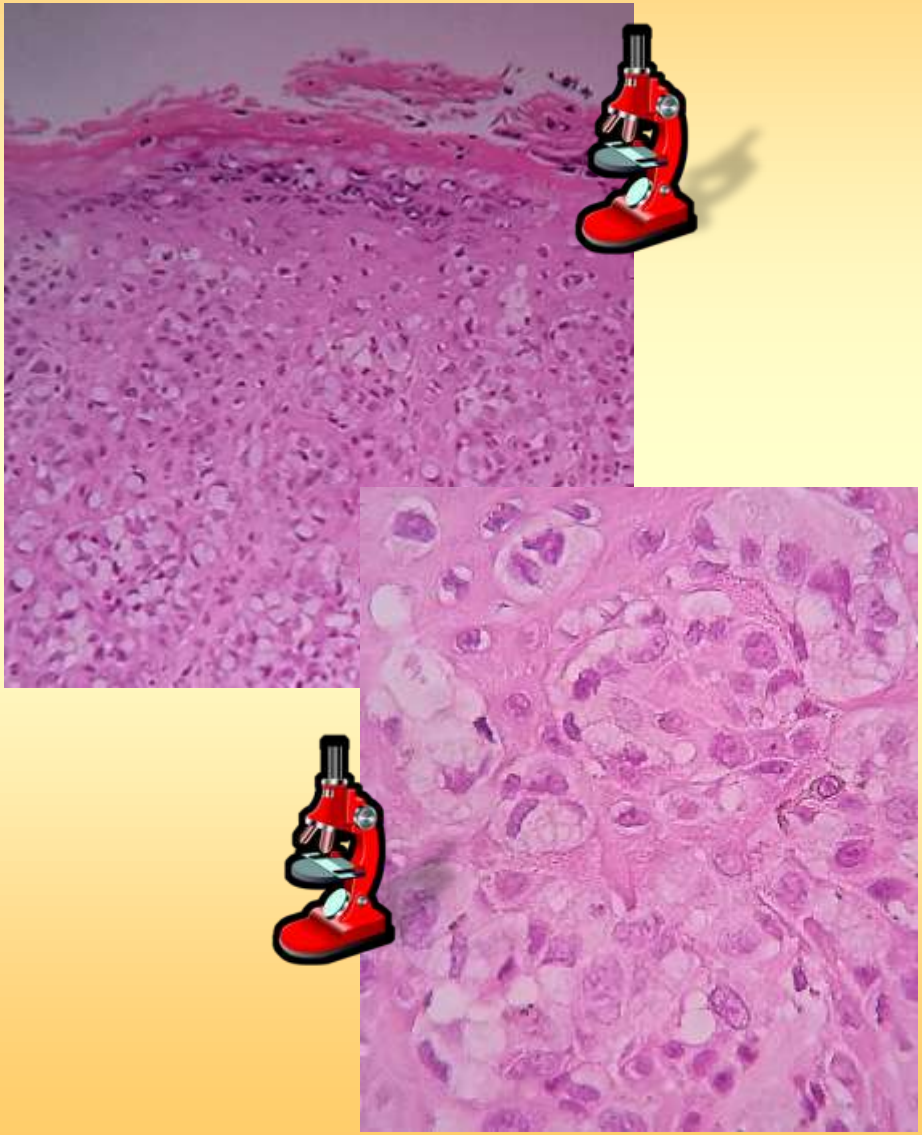
Histopathology report:

Acanthosis and clusters of **polygonal tumour cells** in the lower epidermis (H&E, 100X)

Dermoscope-guided punch biopsy – Extra-mammary Paget's Disease



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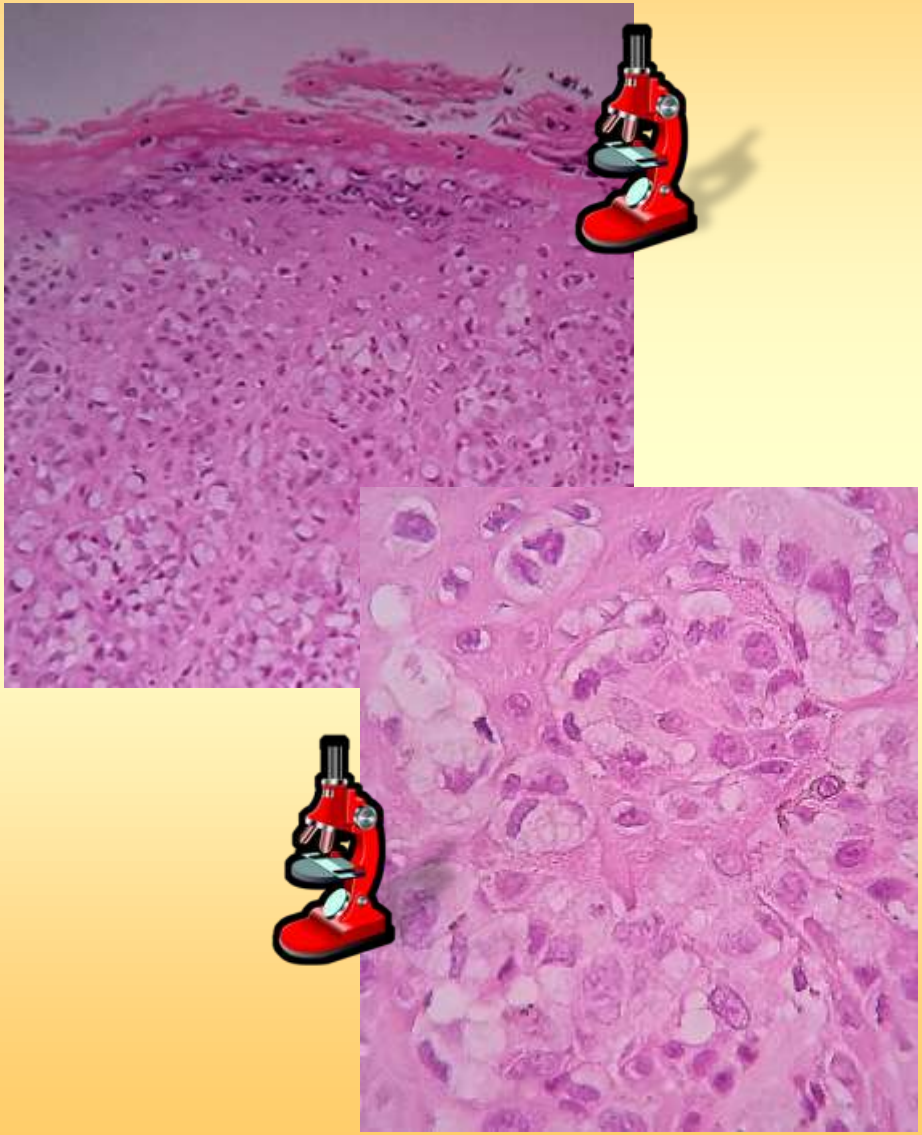
Abundance of **Paget cells** (H&E, 400X)

Dermoscope-guided punch biopsy – Extra-mammary Paget's Disease



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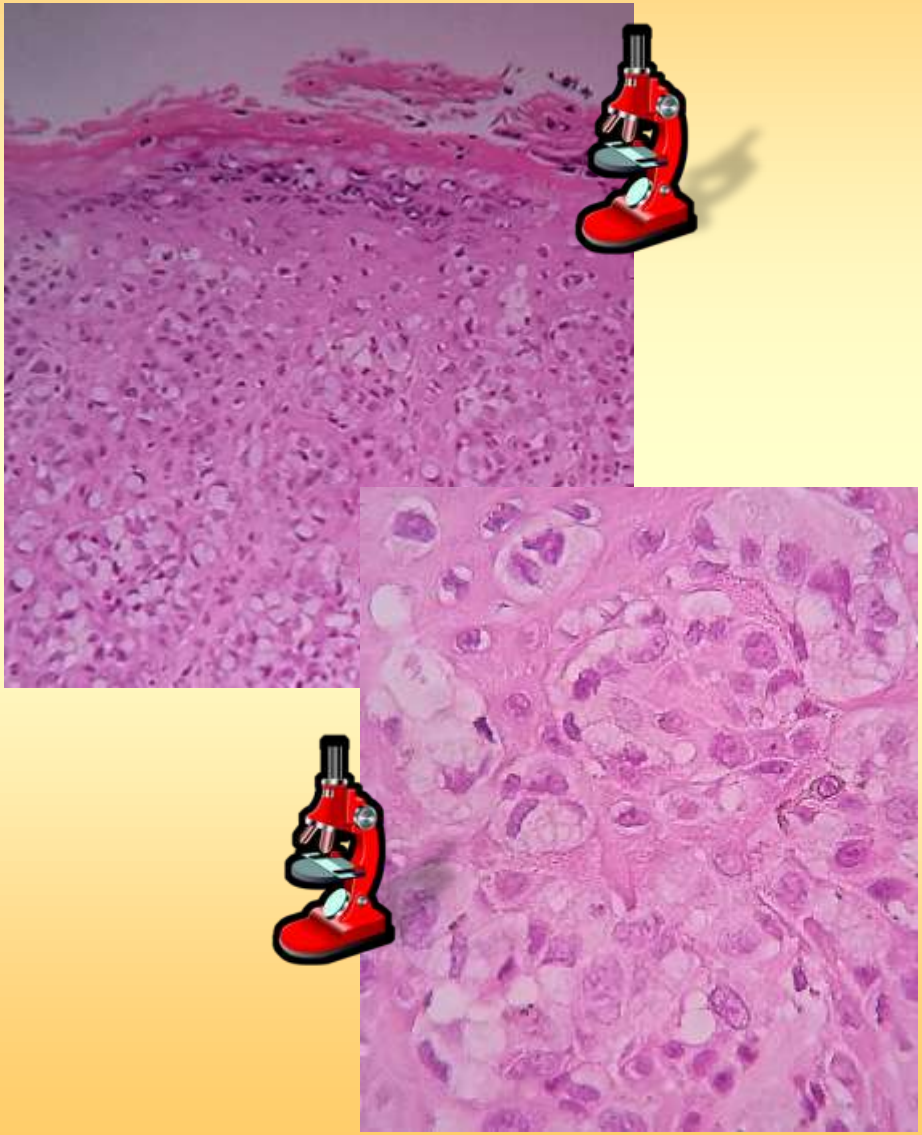
Dermoscope-guided punch biopsy – Extra-mammary Paget's Disease



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A successful example of **dermoscope-guided punch biopsy**.

Extra-mammary Paget's Disease

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J Eur Acad Dermatol Venereol. 2018 Mar;32(3):e92-e94. doi: 10.1111/jdv.14539. Epub 2017 Sep 12.

Dermoscope-guided lesional biopsy to diagnose EMA+ CK7+ CK20+ extramammary Paget's disease with an extensive lesion.

Chuh A[1], Zawar V[2], Fölster-Holst R[3].

Author information

PMID: 28846155 DOI: 10.1111/jdv.14539

Chuh A, Fölster-Holst R, Zawar V. Dermoscope-guided lesional biopsy to diagnose EMA+ CK7+ CK20+ extramammary Paget's disease with an extensive lesion. *J Eur Acad Dermatol Venereol* 2018; **32**: e92-4.

A case-control study on the outcomes of dermoscope-guided surgical procedures in primary case settings

- **Background**
- **Objective**
- **Setting**
- **Methods**
  - **Setup for DGSP**
  - **Retrieving the study and control procedures, analyses**
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- **Comments and future developments**
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Dermoscope-Guided Surgical Procedures
Possible mechanisms

Suspected mechanisms for the superiority of DGSP

- Epiluminescence
- Magnification
- Concomitant flow of two-dimensional images
- Accurate margins of lesions

Dermoscope-Guided Surgical Procedures Possible mechanisms

Suspected mechanisms for the superiority of DGSP

- Epiluminescence **(covered in other presentations)**
- Magnification **(covered in other presentations)**
- Concomitant flow of two-dimensional images
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Dermoscope-Guided Surgical Procedures
Possible mechanisms

Suspected mechanisms for the superiority of DGSP

- Epiluminescence
- Magnification
- **Concomitant flow of two-dimensional images**
- Accurate margins of lesions

Dermoscope-Guided Surgical Procedures – Possible mechanisms – Flow of images

Product features

- Sensor Resolution: 2.0M pixels. Still Image R
  Frame Rate: 30FPS).
- Magnification: 15x - 50x (Native Optical), 15x
  settings.
- Lighting: 8 Ultra-Bright LEDs with fully adjust
  industrialized construction.
- Software: Scalable Window, Zoom, Freeze, R
  balance.
- Polarizer: 12 settings in 30 degree increment

Dermoscope-Guided Surgical Procedures – Possible mechanisms – Flow of images

Specification

Magnification Range: 10x-50x, 220x
Lighting: White LED
Resolution: 640 x 480(for 0.3MP mode
Frame Rate (max): 30 FPS
Operating System: Windows XP, Vista
Connection Type: USB 2.0
Image Save Formats: BMP, GIF, PNG, J
Video Save Formats: WMV, FLV, SWF
Applications: Versatile microscope for
Warranty Period: 2 years

Dermoscope-Guided Surgical Procedures – Possible mechanisms

Suspected mechanisms for the superiority of DGSP

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Dermoscope-Guided Surgical Procedures – Possible mechanisms

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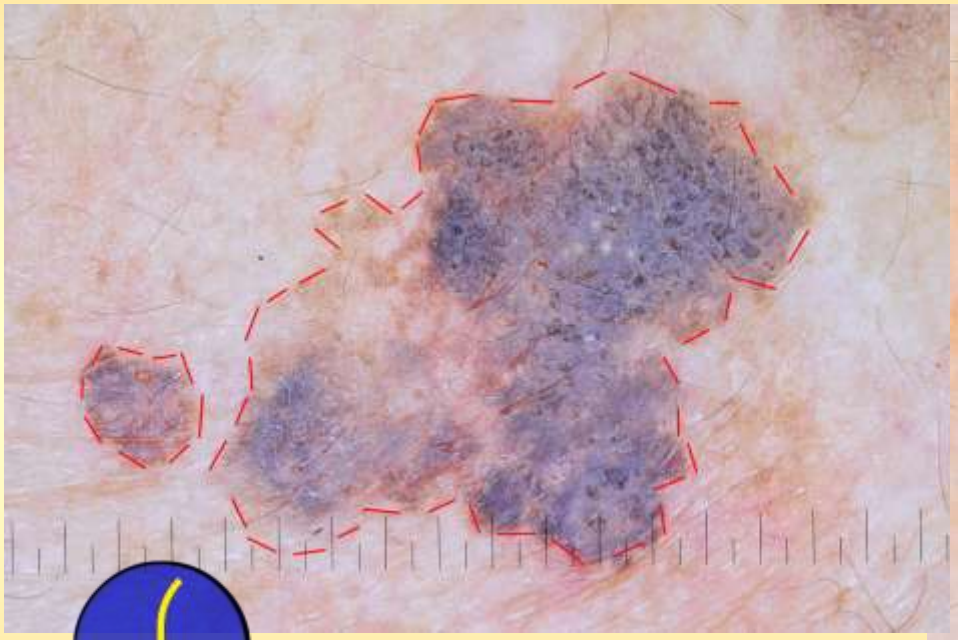
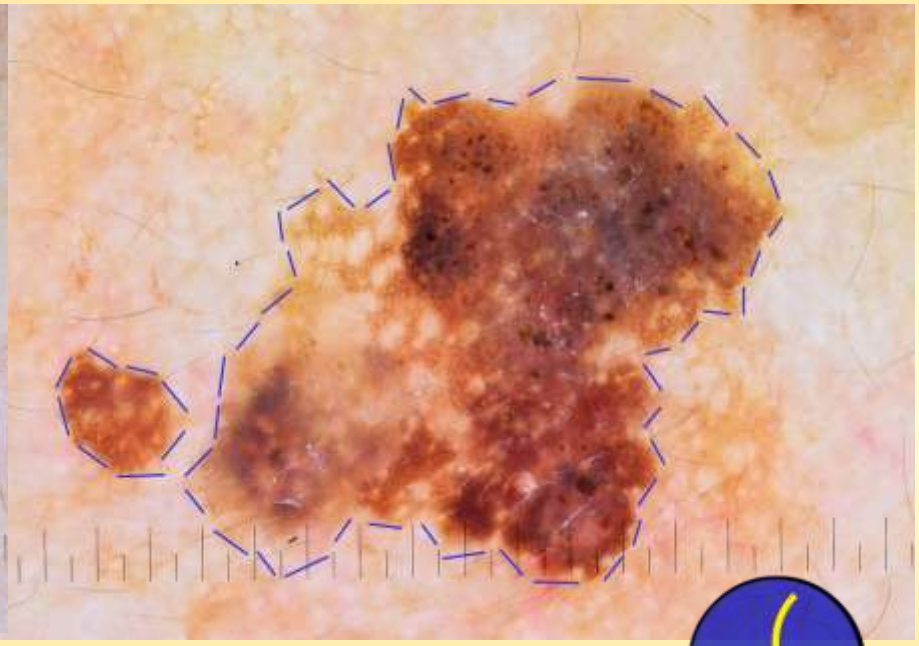
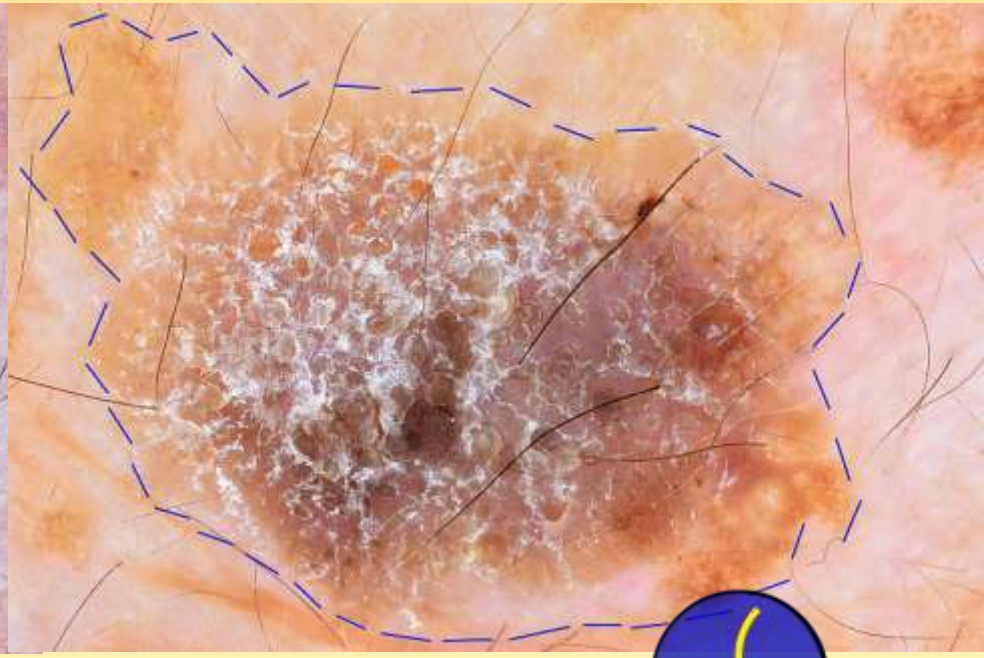
Dermoscope-Guided Surgical Procedures
Possible mechanisms – Margin of lesions





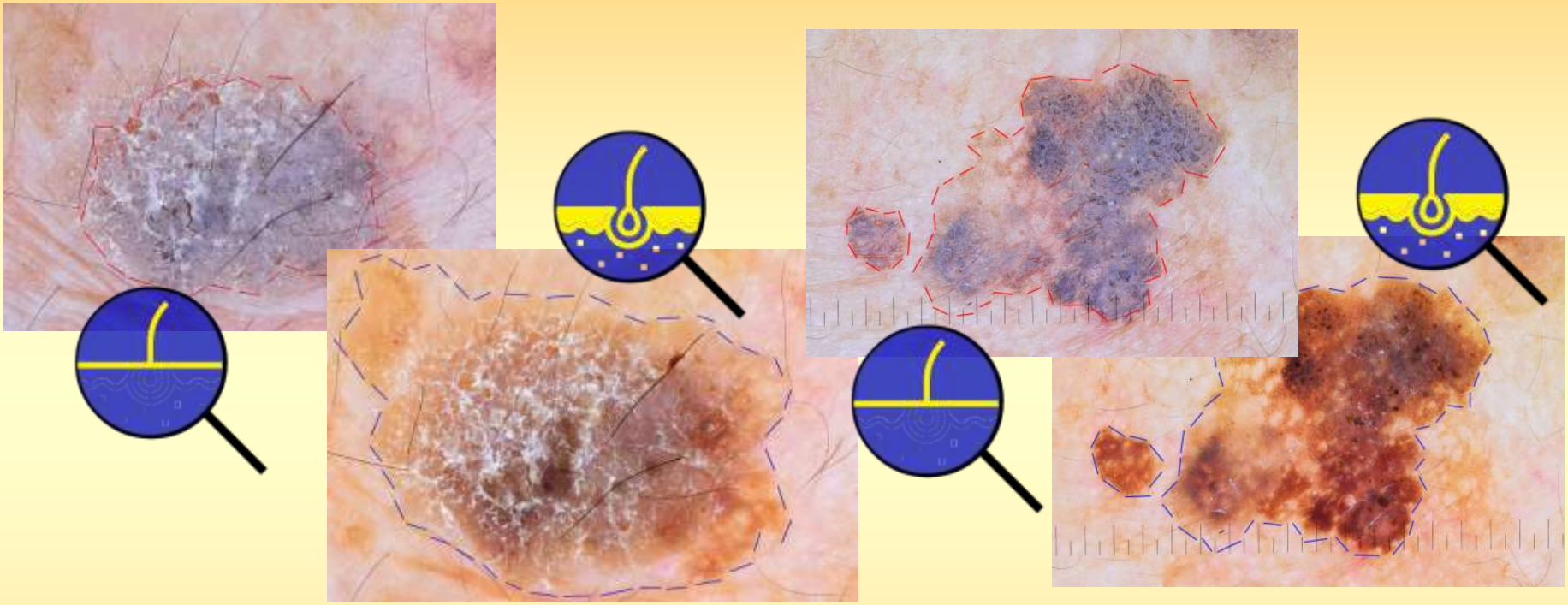
Sometimes, margins of lesions are **very similar** in images with and without cross-polarisation.

Dermoscope-Guided Surgical Procedures
Possible mechanisms – Margin of lesions



Sometimes, they are **not similar**.

Dermoscope-Guided Surgical Procedures
Possible mechanisms – Margin of lesions



Under DGSP, the margins of **three-dimensional** shape of lesions can be appreciated, leading to **lower risks** of **incomplete excision** of lesions.

A case-control study on the outcomes of dermoscope-guided surgical procedures in primary case settings

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Comments
Strengths of our study

- **Novelty** – first systematic study for DGSP
- With age-and-sex **pair-matched controls**
- **Primary care settings** – no bias for the size or natures of lesions

Comments
Strengths of our study

Study procedures

- **Low selective bias** – all procedures in a **clear-cut** six months included

Comments
Strengths of our study

Study procedures

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Controls

- **Low selective bias**
- Most recent
- Age-and-sex **pair-matched**
- Nature of disease and surgical procedures highly **similar**

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- **Low selective bias**
- Most recent
- Age-and-sex **pair-matched**
- Nature of disease and surgical procedures highly **similar**

Therefore

- **No freedom** of the investigators to include or exclude any study or control procedures

Comments
Strengths of our study

Retrospective design

- Clinician blinded while **performing** the procedures and **assessing** outcomes
- Patients also blinded while **assessing outcomes**

Comments
Strengths of our study

- This is the **first** systematic case-control study comparing procedures with and without dermoscope guidance.

- We hope that such will encourage **other investigators** to be engaged in further studies, so as to better the quality of care offered to **patients** with skin diseases.

Comments
Limitations of our study

- Only in **one surgery** with one clinician
- Limits **generalisability** to other clinicians, other clinical settings, and in other locations

Comments
Limitations of our study

- **Small number** of study and control procedures – leading to Type 2 errors (false negative associations)

- No **subgroup analysis**

Comments
Limitations of our study

- Retrospective nature **limits outcome variables**
- No **patient-assessed** outcome measure apart from pain affecting activities of daily living

Comments
Potential future developments

Future studies

- Multi-centred
- International
- True randomisation
- Wide range of indications and procedures for total and **sub-group analyses**

Comments
Potential future developments

Future studies

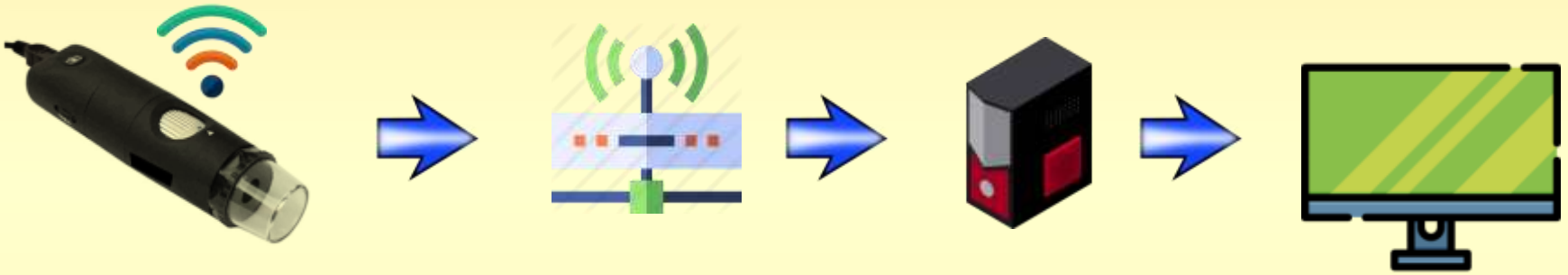
- **Patient-assessed** outcome measures by **validated tools** such as Dermatology Life Quality Index which has been validly translated into Chinese and many other languages

Comments
Potential future developments

Future studies

- **Training** of clinicians and assistants
- Criteria for **hardwares** and softwares
- **Sterilisation**
- Digital **records** for training and documentation

Potential future developments
Virtual reality

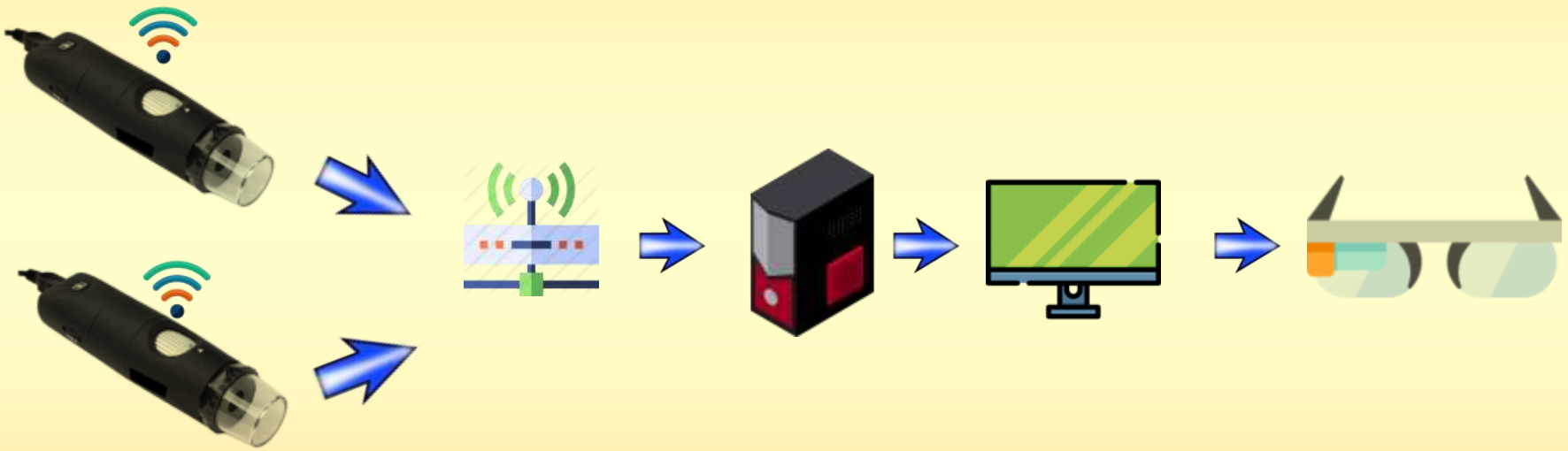


Dermoscope Wireless receiver PC Monitor

Present transmission of data

Potential future developments
Virtual reality

Left channel



Right channel

Wireless receiver

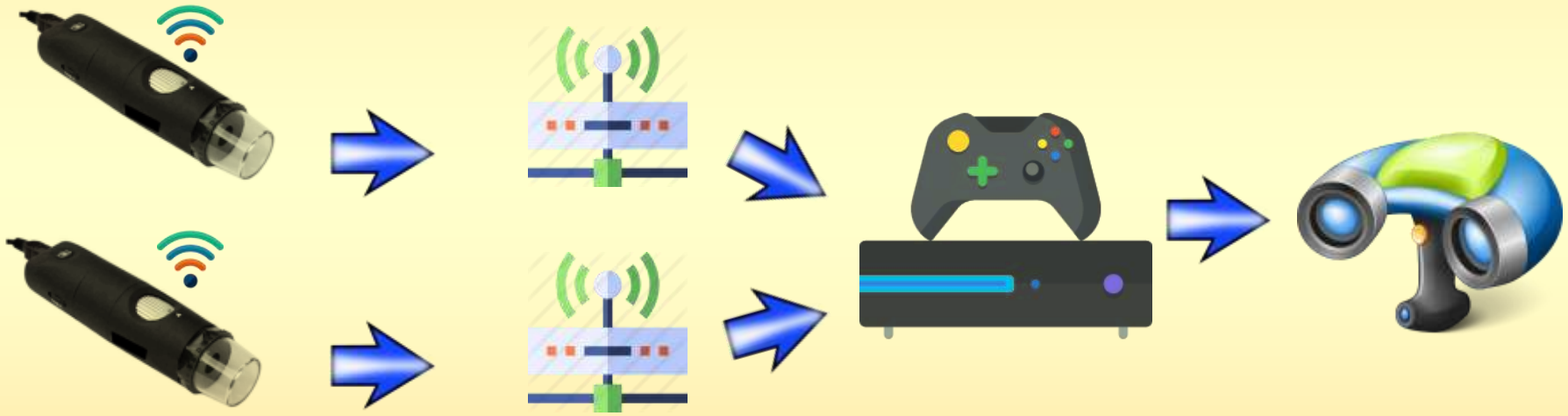
PC

3D monitor

3D glasses

Potential future developments
Virtual reality

Left channel



Right channel

Wireless receivers

Gaming console

Virtual reality eye viewer

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Dermoscope-Guided Surgical Procedures
Implications of our results

Implications of our results:

- DGSP has its **own niche**. Further investigations might unveil strengths and limitations.

Dermoscope-Guided Surgical Procedures
Implications of our results

Implications of our results:

- DGSP has its **own niche**. Further investigations might unveil strengths and limitations.

- With the contributions from other investigators and ourselves, DGSP has a potential to become a **management modality on its own** for a wide spectrum of skin diseases, for bettering our care for **patients**.

Dermoscope-Guided Surgical Procedures Conclusions

In our setting:

- DGSP might **not** affect the rates of **acute complications** such as inflammation.

Dermoscope-Guided Surgical Procedures Conclusions

In our setting:

- DGSP might **not** affect the rates of **acute complications** such as inflammation.
- DGSP might significantly reduce **incomplete removal** of skin lesions.

Dermoscope-Guided Surgical Procedures Conclusions

In our setting:

- DGSP might **reduce** the rate of **scarring**, particularly for **small lesions**.

Dermoscope-Guided Surgical Procedures Conclusions

In our setting:

- DGSP might **reduce** the rate of **scarring**, particularly for **small lesions**.
- DGSP might **not** affect post-operational **pain** related to activities of daily living.

THANK YOU! ^_^

HKSPCD

Hong Kong Society of Primary Care Dermoscopy

hkspcd@gmail.com

Results – Procedures 1-10 (N = 36)

Patient #	Sex	Age	Presentations and indications	Procedures	Final diagnoses	Surgical outcomes
01	M	50	Skin lesion on scalp	Dermoscope-guided (DG) excisional biopsy for histopathology	Seborrhoeic keratosis	Complete removal of lesion.
02	M	65	Skin lesion lateral to right eye	DG excisional biopsy for histopathology	Viral wart	Complete removal of lesion.
			Skin lesion on dorsal surface of distal interphalangeal joint of left middle finger	DG excisional biopsy for histopathology	Viral Wart	Complete removal of lesion.
03	M	42	Skin lesion on upper back	DG excisional biopsy for histopathology	Seborrhoeic keratosis	Complete removal of lesion.
04	M	60	Large skin lesion on left groin extending from left inguinal crease to scrotal wall	DG deep intra-lesional punch biopsy for histopathology and immunohistochemical-staining	# EMA+ CK7+ CK20+ Extramammary Paget's disease	Diagnosis confirmed, image investigations arranged, Wide-excision of the plaque with skin grafts.
05	M	77	Skin lesion on posterior aspect of left cheek	DG excisional biopsy for histopathology	Irritated seborrhoeic keratosis	Complete removal of lesion.
			Skin lesion on anterior aspect of left cheek	DG excisional biopsy for histopathology	Squamous papilloma	Complete removal of lesion.
06	M	67	Acrochordons on anterior aspect of neck, known history with previous lesions sent for histopathological examination	DG electrocautery	Acrochordons	Complete cautery of lesions.
07	M	84	Skin lesion on vertex of scalp	DG excisional biopsy for histopathology	Seborrhoeic keratosis	Complete removal of lesion.
08	M	31	Suspected melanocytic naevus just superior to umbilicus	DG excisional biopsy for histopathology	Intradermal naevus	Complete removal of lesion.
09	F	89	Open wounds on both sides of nasal bridge after accidental fall, adjacent to the left lacrimal sac and nasolacrimal duct.	DG suturing	‖ Accidental injury with open wounds	Satisfactory cosmetic outcome, no injury to adjacent organs and tissues.
10	M	38	Open wound on lateral aspect of left wrist, adjacent to tendons of extensor pollicis brevis and abductor pollicis longus.	DG suturing	Accidental injury with open wounds	Satisfactory cosmetic and functional outcome, no injury to adjacent tissues.

Results – Procedures 11-21 (N = 36)

Patient #	Sex	Age	Presentations and indications	Procedures	Final diagnoses	Surgical outcomes
11	F	32	Plantar viral warts on soles causing pain on walking.	Electrocautery	Viral warts	Complete cautery of all lesions.
12	F	54	Chronic generalised discrete and painful skin erosions.	Punch biopsy at margin of a large lesion on the back for histopathology and direct immunofluorescence studies	Pemphigus vulgaris	Diagnosis of pemphigus confirmed, systemic and topical treatments commenced.
13	M	55	Skin lesion on right cheek	DG excisional biopsy for histopathology	Benign hyperkeratotic lesion with no malignant feature	Complete removal of lesion.
			Skin lesion on left aspect of forehead	DG excisional biopsy for histopathology	Seborrhoeic keratosis	Complete removal of lesion.
14	F	26	Viral wart on radial aspect of distal interphalangeal joint of left finger, professional pianist	DG carbon dioxide laser ablation	Viral wart	Complete ablation of lesion.
15	F	24	Junctional/compound melanocytic naevus on shoulder	DG carbon dioxide laser ablation (the patient declined excisional biopsy and was counselled on the risks incurred)	Junctional naevus	Complete ablation of lesion.
16	M	27	Skin lesion on scrotal skin	DG excisional biopsy for histopathology	Tumoural calcinosis with no malignant feature	Complete removal of lesion.
17	M	7	Skin lesion on anterior aspect of right thigh	DG excisional biopsy for histopathology and immunohistochemical-staining	° CD 68 + S100 - juvenile xanthogranuloma	Complete removal of lesion.
18	M	37	Molluscum contagiosum on shaft of penis, history of similar lesions histopathologically confirmed to be molluscum	DG carbon dioxide laser ablation	Molluscum contagiosum	Complete ablation of lesion.
19	M	14	Plantar viral warts on soles causing pain on walking.	Electrocautery	Viral warts	Complete cautery of all lesions.
20	M	50	Skin mass on left cheek	DG excisional biopsy for histopathology	Seborrhoeic keratosis	Complete removal of lesion.
21	M	61	Skin lesion on left aspect of upper back	DG excisional biopsy for histopathology	Inverted follicular keratosis	Complete removal of lesion.

Results – Procedures 22-32 (N = 36)

Patient #	Sex	Age	Presentations and indications	Procedures	Final diagnoses	Surgical outcomes
22	F	54	Acrochordons on anterior aspect of neck and bilateral axillaries, known history with previous lesions sent for histopathological confirmation	DG electrocautery	Acrochordons	Complete cautery of lesions.
23	F	24	Self-inflicted wound to ventral aspect of left wrist	DG suturing	Self-inflicted open wound	Satisfactory cosmetic and functional outcome, no injury to adjacent tissues.
24	M	61	Skin mass on left aspect of scrotal skin	DG excisional biopsy for histopathology	Fibroepithelial polyp with no malignant feature	Complete removal of lesion.
25	F	64	Skin mass on left forearm	DG excisional biopsy for histopathology	Neurofibroma	Complete removal of lesion.
26	F	26	Viral wart on radial aspect of distal-interphalangeal joint on right middle finger, painful when writing	DG laser ablation	Viral wart	Complete ablation of lesion.
27	F	41	Viral warts on hands and fingers affecting activities of daily living	Electrocautery	Viral warts	Complete cautery of all lesions.
28	M	63	Skin mass on back with recurrent injuries while changing clothing	DG excisional biopsy for histopathology	Benign Fibroepithelial polyp	Complete removal of lesion.
29	F	77	Suspected compound/intradermal melanocytic naevus on bridge of nose with recent enlargement	DG excisional biopsy for histopathology	Benign intradermal naevus	Complete removal of lesion.
30	F	23	Open wound on upper lip after accidental fall injury	DG suturing, mostly on mucosal surface touching the teeth	Accidental injury with open wounds	Satisfactory cosmetic outcome, no injury to adjacent organs and tissues.
31	F	83	Hyperkeratotic mass on left forearm with recurrent bleeding	DG excisional biopsy for histopathology	Benign hyperkeratotic lesion with acute inflammation	Complete removal of lesion.
32	F	29	Viral warts on fingers affecting writing and other activities of daily living	DG carbon dioxide laser ablation	Viral wart	Complete ablation of lesion.

Results – Procedures 33-36 (N = 36)

Patient #	Sex	Age	Presentations and indications	Procedures	Final diagnoses	Surgical outcomes
33	M	49	Suspected acquired compound/intradermal melanocytic naevus on right cheek with recent enlargement and feeling of irritation	DG excisional biopsy for histopathology	Intradermal naevus	Complete removal of lesion.
34	M	49	Suspected flat viral wart anterior to right ear	DG excisional biopsy for histopathology	Viral wart	Satisfactory cosmetic outcome.
35	F	69	Open wound lateral to lateral angle of right eye due to accidental fall with injured region hit against angle of a wooden chair	DG suturing	Accidental injury with open wounds	Satisfactory cosmetic outcome, no injury to adjacent organs and tissues.
36	M	45	Skin mass on left lateral aspect of abdomen	DG excisional biopsy for histopathology	Benign compound naevus	78