

Detection of Sebaceous Gland Hyperplasia with Dermoscopy and Reflectance Confocal Microscopy

Lang Rao

Chengdu second people's hospital

Er-Yi Lin

Dermatology Hospital of Southern Medical University

Weng-Ju Wang

Chengdu second people's hospital

Xiao-wen Huang (✉ huangxw@smu.edu.cn)

Nanfang Hospital, Southern Medical University,

Research Article

Keywords: Dermoscopy, Reflectance confocal microscopy, Sebaceous gland hyperplasia, Sebaceous lobule

Posted Date: May 3rd, 2022

DOI: <https://doi.org/10.21203/rs.3.rs-1611182/v1>

License: © ⓘ This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Abstract

Sebaceous gland hyperplasia (SGH) is a benign cutaneous proliferation of the sebaceous glands that occurs in approximately 1% of the healthy population, mainly males. Our aim was to describe dermoscopy and reflectance confocal microscopy features of sebaceous gland hyperplasia. Thirty-one patients with sebaceous gland hyperplasia diagnosed according to the clinical and histopathological standards were examined using dermoscopy and reflectance confocal microscopy (RCM) from March 2018 to January 2022. Dermoscopically, lesions revealed yellowish-red background and faint yellow background in 25 cases (80.65%) and 6 cases (19.35%) respectively. White-yellowish lobulated structures in the center of the lesion were presented in 31 cases (100%) and umbilications in 19 patients (61.29%). Crown vessels in the peripheral of the lesions were observed in 11 cases (35.48%) while irregular linear vessels on the surface of the lesions in 18 cases (58.06%). Under the reflectance confocal microscopy, all lesions presented a honeycombed pattern in the epidermis and typical morulae-shaped sebaceous lobules in dermis. Dilated follicular infundibulum was observed in 15 cases (48.39%) and dilated vessels in 26 cases (83.87%). In conclusion, dermoscopy and RCM enable us to describe the imaging features of SGH. Combining the two useful tools together provides a non-invasive basis for the accuracy of clinical diagnosis.

1 Introduction

Sebaceous gland hyperplasia (SGH) is a benign cutaneous proliferation of the sebaceous glands that primarily affects the face and increases with UVB exposure and aging. It reportedly occurs in approximately 1% of the healthy population, mainly males [1, 2]. Classic manifestations of SGH are skin-colored or whitish-yellow, normally umbilicated, papules that vary in size from 2 to 9 mm [3]. The diagnosis is usually based on clinical features, and pathological results have diagnostic value. The atypical lesions need to be distinguished from trichoepithelioma, base cell carcinoma, syringoma, molluscum contagiosum and other sebaceous tumors. It is well known that the histopathology is necessary for the definitive diagnosis of SGH, however, it is an invasive examination, which is not easy to accept for patients especially in an exposed area. Dermoscopy is a non-invasive diagnostic tool that permits visualization of many morphologic features from the skin surface to the mid-dermis [4]. Reflectance confocal microscopy (RCM) provides real-time virtual skin biopsies offering microscopic details of the different skin layers up to the papillary dermis [5]. Previous reports have demonstrated dermoscopic manifestations of SGH, but RCM features of SGH and the correlations with dermoscopic manifestations are still lacking. Therefore, the study presented the dermoscopic and RCM features of SGH, and investigate the relationship between them. Results here predict that the integrated application of dermoscopy and RCM is appreciative for the noninvasive diagnosis of SGH.

2 Methods

2.1 Study design

This study was carried out at Department of Dermatology, Chengdu Second People's Hospital and Dermatology Hospital of Southern Medical University, after institutional review board approval. The informed consent was obtained from patients included in this study. Patients of SGH with dermoscopic and RCM examinations from March 2018 to January 2022 were retrospectively investigated. Inclusion criteria for our study was the lesions located on the face and only one lesion selected randomly for each patient. The exclusion criteria was cases with poor dermoscopic or RCM image quality. Medical records of enrolled patients were reviewed to analyze their demographic information, duration, the size of the lesion, dermoscopic and RCM features.

2.2 Dermoscopic and RCM analysis

Dermoscopic images were recorded by means of a digital video microscope (Dino-Lite AM7515MZTL, JEDA, Nanjing, China and New visionview UHD 4K, HONSKIN, Beijing, China). Images were collected by using non-contact polarized mode with 30- and 35-fold magnification. RCM images were obtained by Vivascope 1500 reflectance confocal microscope (Lucid Inc. Rochester, NY, USA), at a standard, horizontal 500×500 um section of the skin at a selected depth from the epidermal surface to the papillary dermis.

In dermoscopy, background colour, vascular morphology, scale and other morphological characteristics of lesions were assessed; in RCM, features such as the architecture of epidermis, the structure of hair follicle, the morphology of nest in dermis and character of vessels were evaluated. Dermoscopic and RCM images were reviewed by two of the authors (Lang Rao and Er-Yi Lin), who were blinded to the histopathological diagnosis.

2.3 Statistical analysis

Data was collected and analyzed by SPSS 17. Descriptive statistics were presented as a mean result with standard deviation for numeric variables and the numerical amount and percentage for categorical variables.

3 Results

3.1 Clinical characteristics

A total of 31 cases of histologically diagnosed SGH were included in our study: twenty-six men (83.87%) and five women (16.13%), with a mean age of 54.23 ± 12.85 years (range from 23 to 75 years). The average duration was 21.77 ± 15.35 months (range from 4 to 72 months). All the lesions were located on the face and the mean size measured by dermoscopy was 6.18 ± 1.62 mm (rang from 3.6 to 10 mm) (Table 1).

3.2 Dermoscopic and RCM features of SGH

The specific dermoscopic features of SGH are shown in Table 2 and Fig. 1. The most common dermoscopic finding was aggregated white-yellowish lobulated structure in the center of the lesion

(present in 100% of the cases). The lesions under dermoscopy revealed yellowish red background and faintly yellow background in 25 cases (80.65%) and 6 cases (19.35%) respectively. Scales were observed in only 3 cases (9.68%). Typical umbilication in the center of these white-yellowish structures was also very common (61.29%) in SGH patients. Crown vessels in the peripheral of the lesions were observed in 11 cases (35.48%) while irregular linear vessels on the surface of the lesions in 18 cases (58.06%).

The RCM features of SGH are summarized in Table 2 and Fig. 2. All the lesions revealed a honeycombed pattern in the epidermis and typical morulae-shaped sebaceous lobules in the dermis. In addition, the sebaceous lobules were composed of round cells with speckled cytoplasm and dark nuclei, which were surrounded by hyper-refractile cytoplasm in 15 (48.39%) cases. Dilated follicular infundibulum was observed in 15 (48.39%) cases and the majority of lesions (83.87%) displayed dilated vessels in the superficial dermis. However, inflammatory cells were observed in only 2 (6.45%) patients.

4 Discussion

Sebaceous glands are composed of holocrine acini attached to a common excretory duct and a follicle, and together they comprise the pilosebaceous unit. In SGH, the sebaceous glands are normal in structure but increased in number [6]. Since all the acini are attached to the central duct, which may become dilated, as well as the follicular infundibulum, when the sebaceous glands increased. In our study, a dilated central follicular infundibulum containing medium and high refraction structures were present in 15 cases (48.39%) under RCM examination, correlating with the central umbilication noted by dermoscopy in 19 cases (61.29%). As Neda et al [7]. reported, the dilated central duct and follicular infundibulum contained sebum and keratin debris, so the feature of umbilication in SGH observed by dermoscopy is different from molluscum contagiosum. In molluscum contagiosum, the umbilication corresponds to molluscum bodies, which show round, well-circumscribed lesion with a central round cystic area filled with brightly refractile material in RCM [8].

This study showed that white-yellowish lobulated structures were the most common dermoscopic features in SGH, corresponding to the morulae-shaped sebaceous lobules observed under RCM. Bryden and colleagues [9] named it as a "cumulus sign", which can be easily distinguished from the blue gray ovoid nest in base cell carcinoma under dermoscopy. Moreover, the presence of morulae-shaped structure in SGH compare to bright tumor islands observed in base cell carcinoma and trichoepithelioma indicates its value as a distinguishing feature. Additionally, morulae-shaped structure has also been described in sebaceous nevus, further identification is needed in clinical manifestation and histopathological examination.

Regarding vascular structures we found irregular linear vessels (58.06%) were the most common vessel type in SGH, followed by crown vessels (35.48%). This is different from the findings of Argenziano and Oztas [10, 11] that crown vessels were the most common vascular pattern. Arborizing vessels were observed in 2 (6.45%) cases, identification of non-pigmented base cell carcinoma through other structures or RCM examination is required. The different vascular pattern in dermoscopic presented as

dark dilated vessels in RCM, that were observed in 26 (83.87%) cases. In dermoscopic analysis of our study, monomorphic vessel pattern was mainly perceived, while Chun-Yu Cheng et al. [12] reported that the polymorphic vessel pattern often indicates the malignant tumor, such as sebaceous carcinoma.

In 13 cases (41.94%) sebaceous lobules surrounded by hyper-refractile cytoplasm were noticed, this finding is also supported by Fraga-Braghiroli et al. [13] Notably, the surrounding dermis showed amorphous bright, broadened and reticulated collagen fibers compatible with solar elastosis. This is not rare in patients with SGH.

In summary, we have examined SGH by dermoscopy and RCM and correlated them with corresponding histopathological findings. There are mainly three dermoscopic and RCM features noticeable in SGH, which are helpful for diagnosis and differential diagnosis: (i) white-yellowish lobulated structures in faintyellow or yellowish red background, corresponds to the morulae-shaped sebaceous lobules in RCM; (ii) umbilication in the center of the lesion, corresponds to dilated follicular infundibulum in RCM; (iii) crown or linear-irregular vessels, corresponds to dark dilated vessels in RCM. The main limitation of our study is the relatively small number of patients. Secondly, we only selected the lesions on the face. Further studies with large samples are needed to test our findings and explore the usefulness of dermoscopy and RCM as a non-invasive diagnostic tool in SGH.

Table 1
Clinic characteristics of the patient's group

Gender	n(%)
Female	26(83.87)
Male	5(16.13)
Age(years)	Mean(rang)
Female	51 ± 16.99(23–68)
Male	54.85 ± 12.23(30–75)
Duration(months)	
Female	20.6 ± 8.99(13–36)
Male	22 ± 16.42(4–72)
Size(mm)	
Female	6.92 ± 2.40(4.3–10)
Male	6.03 ± 1.45(3.6–8.3)

Table 2
Dermoscopic and RCM characteristics of SGH

	<i>n</i> (%)
Dermoscopic feature	
Faintyellow background	6(19.35)
Yellowish red background	25(80.65)
White-yellowish lobulated structure	31(100)
Umbilication	19(61.29)
Crown vessel	11(35.48)
Irregular linear vessel	18(58.06)
Arborizing vessel	2(6.45)
Scale	3(9.68)
RCM feature in epidermis	
Honeycombed pattern	31(100)
Streaming in epidermis	4(12.90)
Dilated follicular infundibulum	15(48.39)
Morulae-shaped sebaceous lobules	31(100)
Dilated vessels	26(83.87)
Inflammatory cells in superficial dermis	2(6.45)
Sebaceous lobules surrounded by hyper-refractile cytoplasm	13(41.94)
<i>RCM reflectance confocal microscopy, SGH sebaceous gland hyperplasia</i>	

Declarations

Compliance with ethical standards

FundingNone.

Conflict of interest We declare no competing interests.

Ethical approval All procedures performed in our study involving human participants were in accordance with the ethical standards of the institutional and national research committee. We got the approval of our institution ethical committee before the beginning of the study.

Informed consent Informed consent was obtained from all individual participants included in the study.

References

1. Pedro Zaballos, Ignacio Gómez-Martín, José María Martín, José Bañuls (2018) Dermoscopy of Adnexal Tumors. *Dermatol Clin* 36(4):397–412.
2. Lama Hussein, Conal M Perrett (2021) Treatment of sebaceous gland hyperplasia: a review of the literature. *J Dermatolog Treat* 32(8):866–877.
3. Katharina Flux (2017) Sebaceous Neoplasms. *Surg Pathol Clin* 10(2):367–382.
4. N E Abdel-Azim, S A Ismail, E Fathy (2017) Differentiation of pityriasis rubra pilaris from plaque psoriasis by dermoscopy. *Arch Dermatol Res* 309(4):311–314.
5. H Dai, H-Y Jiang, A-E Xu (2018) Detection of lichen planus pigmentosus with dermoscopy and reflectance confocal microscopy. *Skin Res Technol* 24(4):699–700.
6. Jean Iacobelli, Nathan Tobias Harvey, Benjamin Andrew Wood (2017) Sebaceous lesions of the skin. *Pathology* 49(7):688–697.
7. Neda Shahriari, Jane M Grant-Kels, Harold Rabinovitz, Margaret Oliviero, Alon Scope (2021) Reflectance confocal microscopy: Diagnostic criteria of common benign and malignant neoplasms, dermoscopic and histopathologic correlates of key confocal criteria, and diagnostic algorithms. *J Am Acad Dermatol* 84(1):17–31.
8. Francesco Lacarrubba, Anna Elisa Verzì, Marco Ardigò, Giuseppe Micali (2017) Handheld reflectance confocal microscopy for the diagnosis of molluscum contagiosum: Histopathology and dermoscopy correlation. *Australas J Dermatol* 58(3):e123-e125.
9. A M Bryden, R S Dawe, C Fleming (2004) Dermatoscopic features of benign sebaceous proliferation. *Clin Exp Dermatol* 29:676–7.
10. Giuseppe Argenziano, Iris Zalaudek, Rosamaria Corona, Francesco Sera, Lorenza Cicale, Gianluca Petrillo, Eleonora Ruocco, Rainer Hofmann-Wellenhof, H Peter Soyer (2004) Vascular structures in skin tumors: a dermoscopy study. *Arch Dermatol* 140(12):1485–9.
11. P Oztas, M Polat, M Oztas, N Alli, H Ustun (2008) Bonbon toffee sign: a new dermatoscopic feature for sebaceous hyperplasia. *J Eur Acad Dermatol Venereol* 22(10):1200–2.
12. Chun-Yu Cheng, Hsing-Jou Su, Tseng-Tong Kuo (2020) Dermoscopic features and differential diagnosis of sebaceous carcinoma. *J Dermatol* 47(7):755–762.
13. N A Fraga-Braghiroli, A Stephens, D Grossman, H Rabinovitz, R P R Castro, A Scope (2014) Use of handheld reflectance confocal microscopy for in vivo diagnosis of solitary facial papules: a case series. *J Eur Acad Dermatol Venereol* 28(7):933–42.

Figures

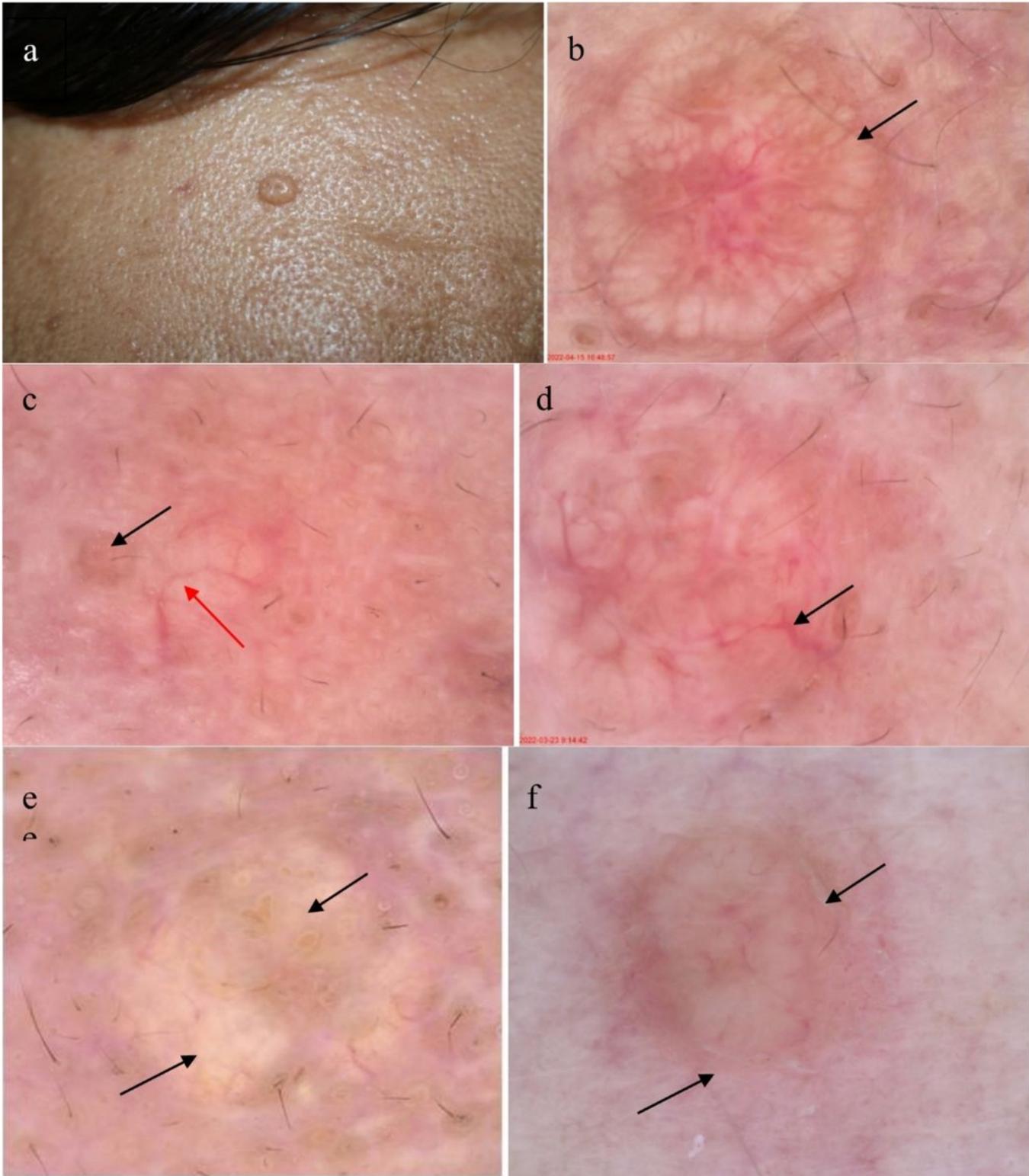


Figure 1

Patient with sebaceous gland hyperplasia (SGH) on the face (a); dermoscopic examination of SGH shows white-yellowish lobulated structures surrounded by crown vessel (black arrow) in yellowish red background (b) (30×); dermoscopic image shows typical umbilication (black arrow) in the center with irregular linear vessel (red arrow) (c) (30×); dermoscopic image shows arborizing vessel (black arrow) (d) (35×); dermoscopic image shows white-yellowish lobulated structures (black arrow) in faintly yellow

background (e) (35×); dermoscopic image reveals white scales (black arrow) around the white-yellowish structures (f) (30×).

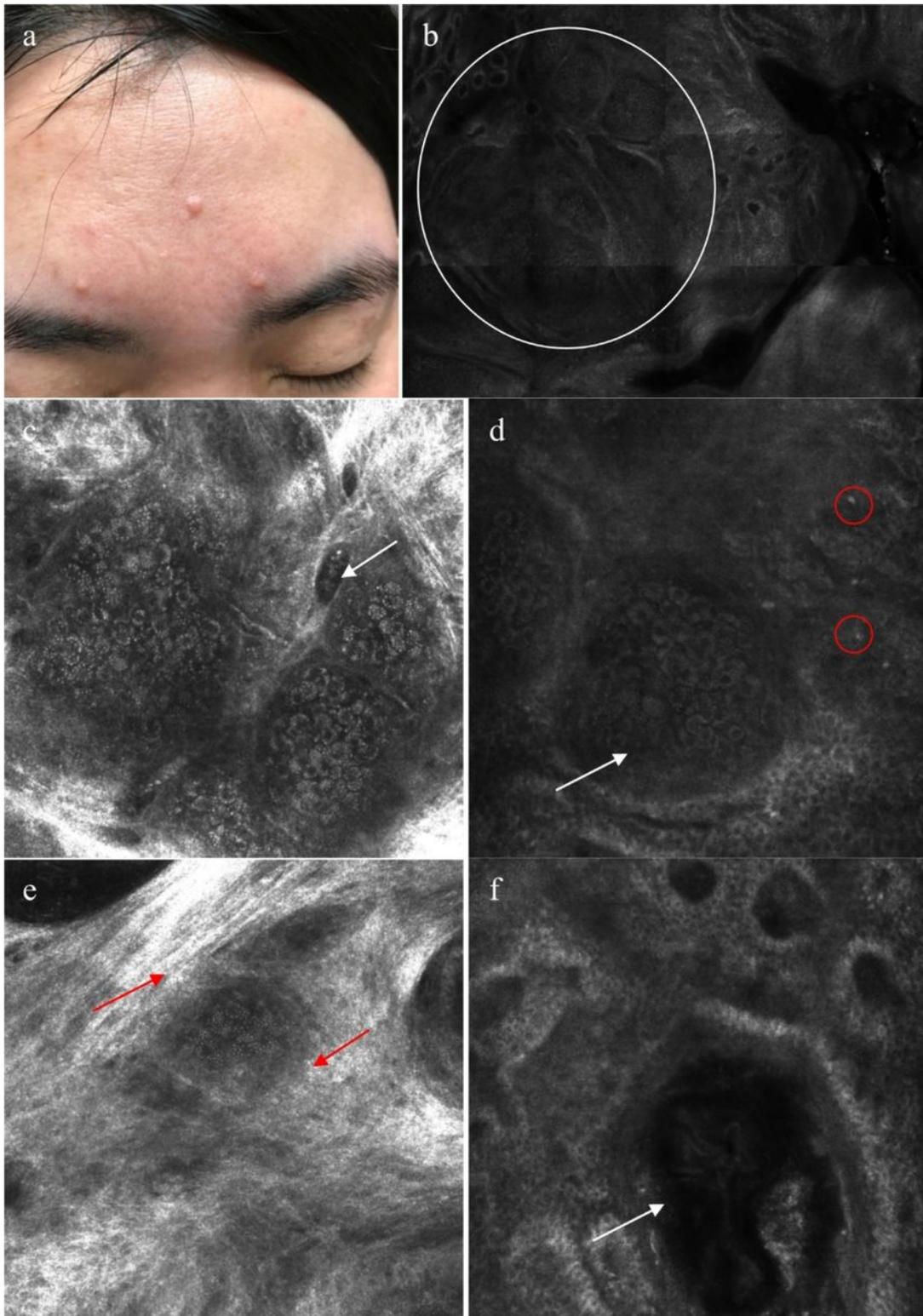


Figure 2

Patient with sebaceous gland hyperplasia (SGH) on the face (a); reflectance confocal microscopy (RCM) shows aggregated morulae-shaped sebaceous lobules (white circle) (b); dilated vessel (white arrow) (c);

RCM images reveals morulae-shaped sebaceous lobules (white arrow) with a few inflammatory cells (red circle) in superficial dermis (d); sebaceous lobules surrounded by hyper-refractile cytoplasm (red arrow) (e); a dilated follicular infundibulum with medium and high refraction materials contained (white arrow) (f).