

Impact of COVID-19 Pandemic on the Surgical Management of Sebaceous Cysts: A Comparative Study from Benghazi, Libya

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تأثير جائحة كوفيد-19 على التدبير الجراحي للأكياس الدهنية: دراسة مقارنة من بنغازي، ليبيا

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Abstract:

The study examines the epidemiological statistics of sebaceous cyst excisions during the COVID-19 pandemic in 2020 and 2021 and the post-COVID period in 2022 and 2023. These include changes in the age of patients, anatomical site distribution, and whether or not the cysts were infected upon presentation to the hospital. Retrospectively, and using an observational design, data have been extracted from Al Jala Hospital records – Benghazi. More specifically, sebaceous cyst excisions significantly dropped during the pandemic period before rebounding again. There is substantial difference in the percentage of infected cysts presented and the back found to be the most affected anatomical site. These results highlight the impact of healthcare disruptions on routine inductive surgical care and patient presentation, warranting the consideration of improving healthcare strategies during public health crises.

Keywords: Surgery, Histology, Cyst, COVID-19 pandemic, Epidemic, Excision, Benign.

المخلص:

تتناول هذه الدراسة الإحصاءات الوبائية لعمليات استئصال الأكياس الدهنية خلال جائحة كوفيد-19 في عامي 2020 و2021، وفترة ما بعد الجائحة في عامي 2022 و2023. وتشمل هذه الإحصاءات التغيرات في أعمار المرضى، وتوزيع مواقع الأكياس في الجسم، وما إذا كانت الأكياس مصابة بالعدوى عند مراجعة المرضى للمستشفى. وباستخدام منهجية رصدية، تم استخلاص البيانات من سجلات مستشفى الجلاء في بنغازي. وبشكل واضح، انخفضت عمليات استئصال الأكياس الدهنية بشكل كبير خلال فترة الجائحة قبل أن تعود لارتفاع مجدداً. بالإضافة إلى اختلاف كبير في نسبة الغدد المصابة بالعدوى وارتفاع نسبة وجودها في الظهر بعكس الكثير من الدراسات. تسلط هذه النتائج الضوء على تأثير اضطرابات الرعاية الصحية على الرعاية الجراحية الروتينية وحالة المريض، مما يستدعي النظر في تحسين استراتيجيات الرعاية الصحية أثناء أزمات الصحة العامة.

الكلمات المفتاحية: جراحة، أنسجة، كيس دهني، جائحة كوفيد، وباء، استئصال، حميدي.

Introduction:

Sebaceous cysts (better termed epidermoid cysts) are benign, slow-growing sub-epidermal nodules filled with keratin material (1). They are a common clinical presentation of cysts and they manifest as mobile dome-shaped swelling which can appear anywhere on the body, but predominantly seen on the face, neck, trunk and scalp (2). Sometimes the cysts become inflamed, infected, or rupture, and surgical excision is the only definitive treatment that prevents recurrences. The management of epidermoid cysts, especially elective excisions, is a regular dermatological and minor surgical practice (3).

Most of the sebaceous cysts excised under local anesthesia, except those with huge size or multiplicity. Swelling defined and clear-cut incision done within epidermis and dermal layers to expose the cyst. Elliptical incision could be designed if punctum and skin redundancy presented. Dissection applied around cyst to release its attachment from surrounding tissue. Careful detachment with keeping the cyst intact will decrease recurrence rate. Control of feeding vessels with ligation or cauterisation and good cleaning for pocket done before closure with simple sutures, which kept from 5 -14 days according to the site (face 5 days - scalp 10 days - trunk 14 days) .Antibiotic usually not recommended if the cyst was not infected . Just wound care until time of suture removal (1).

The COVID-19 pandemic, which began in early 2020, had a major effect on healthcare systems worldwide and caused significant disruptions to medical services (4). To reallocate resources, minimize viral transmissions, and handle the surge of COVID-19 cases, the policy on elective surgical procedures was put on hold or cancelled in many countries (5). This surgical volume and patient presentation manipulation was witnessed across various specialties (6). There has been a general decrease in elective as well as non-elective cases, with elective surgical volumes dropping by up to 32% in some regions (7). Other forms of dermatological surgery, particularly the excision of benign lesions, were also deferred to allow prioritization of the treatment of more urgent cases, such as high-risk skin cancers (8). Despite the impact recorded across the board concerning surgical activity during the pandemic, there is a shortage of accurate epidemiological data specifically regarding sebaceous cyst excisions with respect to patient age, anatomical site distribution, and infection prevalence upon presentation during and immediately after the peak of the COVID-19 crisis. This knowledge helps understand the long-term effects of disruption and guides future public health policies. Sebaceous cysts are a good example of this because they can be acute (inflamed cysts) or more commonly non-acute (even if they require excision, the surgery is mainly elective).

Aims of the Study:

This study aims to perform a comparative epidemiological study on the excision of sebaceous cysts. Specifically, we plan to investigate and compare the demographic characteristics (age), (sex), anatomical site distribution as well as the infection status of sebaceous cysts excised during the acute phase of the COVID-19 pandemic (2020-2021) against subsequent post-covid (2022-2023) in a surgical local Centre.

Patients and Method:

This retrospective comparative analytical study at Al Jala surgical hospital – Benghazi. The medical records of patients who had undergone excision of sebaceous (epidermoid) cysts were reviewed, covering the period between January 2020 and December 2023. Inclusion criteria were: patients of any age with histopathological reports confirming diagnosis of sebaceous (epidermoid) cyst who underwent complete surgical excision. Patients were divided into two groups; COVID period (2020–2021) and post-COVID period (2022–2023). Data included age, sex, anatomical site, and infection status at excision. For statistical analysis, an independent t-test was used for continuous variables, while the Chi-square test was employed for categorical variables. A p-value of less than 0.05 was considered to be statistically significant.

Results:

A total of 147 patients underwent excision of sebaceous (epidermoid) cysts during the study period. 46 cases were recorded during the COVID period (2020–2021), while 101 cases were documented in the post-COVID period (2022–2023). The mean age was 42.9 ± 13.6 years in the COVID period and 42.5 ± 14.5 years post-COVID, with no statistically significant difference ($p > 0.05$). Males constituted 54.3% of cases during COVID and 61.4% post-COVID, also without significant difference ($p > 0.05$). (Table 1)

Table (1): Demographic Characteristics of Patients

Variable	COVID Period (2020–2021) n = 46	Post-COVID Period (2022–2023) n = 101	p-value
Mean age (years)	42.9 ± 13.6	42.5 ± 14.5	>0.05
Male	25 (54.3%)	62 (61.4%)	>0.05
Female	21 (45.7%)	39 (38.6%)	

Infected cysts accounted for (63.0%) of cases during the pandemic (37%) were not infected cysts compared with (49.5%) in the post-pandemic period (50.5%) not infected; however, this difference did not reach statistical significance ($p > 0.05$) (Figure 1).

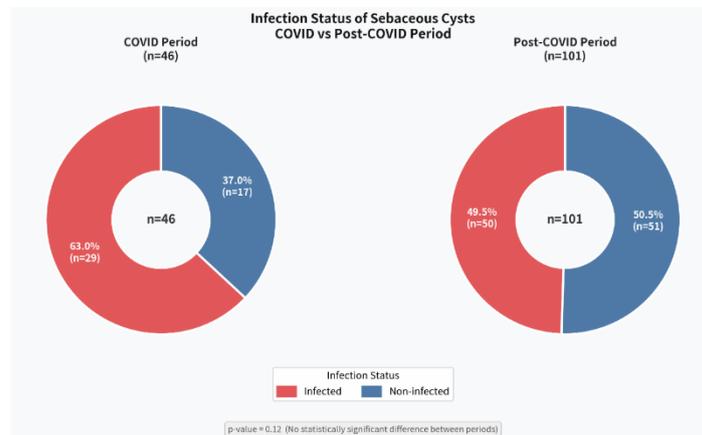


Figure (1): Infection Status of Sebaceous Cysts

A total of 147 sebaceous cysts were analyzed. Overall, 79 cases (53.7%) were infected, while 68 cases (46.3%) were non-infected. The back was the most common anatomical site, accounting for 42 cases (28.6%), followed by the scalp with 23 cases (15.6%) and the face with 14 cases (9.5%) (Figure2).

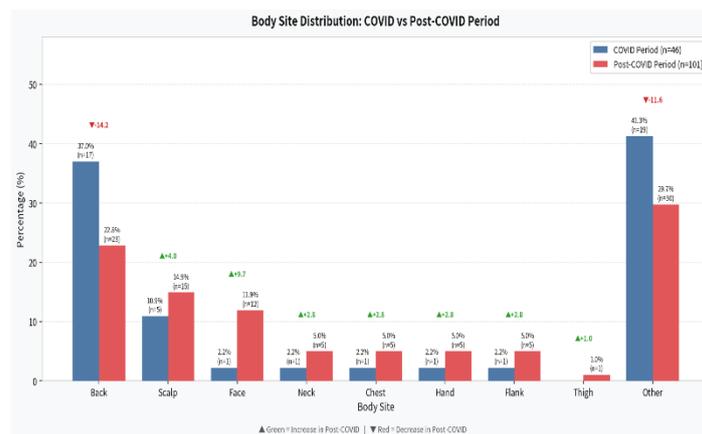


Figure 2. Anatomical Distribution of Cysts

The highest infection rate was observed in cysts located on the back (59.5%), followed by the scalp (52.2%) and the face (50.0%). Lower infection rates were noted in the neck, chest, and hand (37.5% each), while the flank showed the lowest infection rate (25.0%). Only one case was reported on the thigh, which was non-infected (Table 2).

Table (2): Distribution of the status of the cysts according body sites

Site	Infected n (%)	Non-Infected n (%)	Total n (%)	Infection Rate
Back	25 (59.5%)	17 (40.5%)	42 (28.6%)	59.5%
Scalp	12 (52.2%)	11 (47.8%)	23 (15.6%)	52.2%
Face	7 (50.0%)	7 (50.0%)	14 (9.5%)	50.0%
Neck	3 (37.5%)	5 (62.5%)	8 (5.4%)	37.5%
Chest	3 (37.5%)	5 (62.5%)	8 (5.4%)	37.5%
Hand	3 (37.5%)	5 (62.5%)	8 (5.4%)	37.5%
Flank	2 (25.0%)	6 (75.0%)	8 (5.4%)	25.0%
Thigh	0 (0%)	1 (100%)	1 (0.7%)	0%
Other/Unknown	24 (49.0%)	25 (51.0%)	49 (33.3%)	49.0%
Total	79 (53.7%)	68 (46.3%)	147	53.7%

Chi-square $p \approx 0.15$ (no significant association). Back sites show highest infection risk.

All of the reports observed confirmed the diagnosis of keratinous cysts after excision, most of them with very recognized histopathological features (Figure 3).

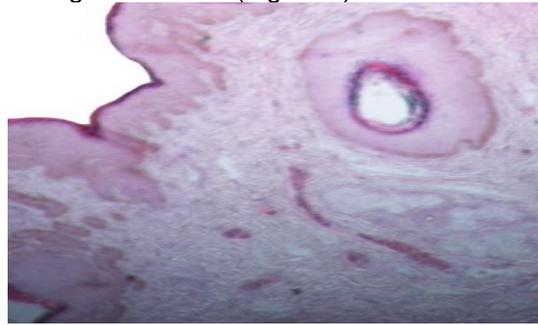


Figure (3): Typical histopathological features of Sebaceous Cysts

Low-power photomicrograph showing a dermal cystic lesion lined by stratified squamous epithelium with keratinous content, consistent with an epidermoid cyst (H&E stain, $\times 40$).

Discussion:

This comparative epidemiological study aimed to investigate the impact of the COVID-19 pandemic on the characteristics of sebaceous cyst excisions. Our findings suggest significant shifts in surgical volumes and patient presentations, reflecting the broader disruptions to healthcare services during the pandemic and the subsequent recovery.

The observed decrease in overall sebaceous cyst excision volume during the COVID-19 period (2020-2021) aligns with numerous studies reporting a substantial reduction in elective surgical procedures globally (7)(9). This reduction was primarily driven by the reallocation of resources to manage COVID-19 patients, fear of viral exposure among patients, and government-mandated lockdowns (5). The subsequent increase in excision volume in the post-COVID period (2022-2023) indicates a return to pre-pandemic surgical activity, possibly coupled with a backlog of deferred cases.

Regarding demographic characteristics, our study found no statistically significant differences in the mean age (42.9 ± 13.6 years vs. 42.5 ± 14.5 years, $p > 0.05$) or sex distribution (54.3% males vs. 61.4% males, $p > 0.05$) of patients undergoing sebaceous cyst excisions between the two periods. Male gender was always more than female gender. This stability suggests that the underlying demographic profile of individuals requiring sebaceous cyst excision remained consistent, despite the external pressures of the pandemic. It implies that the factors influencing who sought care, or who was prioritized for care, did not disproportionately affect specific age or sex groups for this particular condition.

While not reaching statistical significance ($p > 0.05$), the observed trend in infection status is clinically noteworthy. During the COVID-19 period, 63.0% of excised cysts were infected or inflamed at presentation, compared to 49.5% in the post-COVID period. This trend, although not statistically robust in our dataset, suggests a potential delay in presentation for many patients during the pandemic. Patients might have postponed seeking medical attention for asymptomatic sebaceous cysts, only presenting when the cyst became acutely symptomatic (infected or inflamed), thereby transforming an elective procedure into a more urgent one. This phenomenon has been observed for other conditions during the pandemic, where delays in care led to more advanced or complicated disease presentations (10). The prioritization of urgent cases by healthcare providers during times of resource strain could also contribute to a higher proportion of infected cysts being operated on during the pandemic period.

In this retrospective series of 147 sebaceous cyst excisions in Benghazi, Libya (2020-2023), the back emerged as the predominant anatomical site (28.6% of cases), carrying the highest post-operative infection rate at 59.5%—notably exceeding rates in peripheral sites like flank (25.0%) or extremities (37.5%) (Table 2). This pattern aligns with broader literature identifying the trunk, particularly the back, as a high-risk zone for epidermoid cyst complications due to its larger surface area, friction from clothing, bacterial colonization (e.g., *Staphylococcus aureus*), and challenges in post-operative wound care (9). But also this result contrasts with a number of research published in the international literature that state that epidermoid cysts are most commonly found in the head and neck region. For instance, the head and neck region accounted for 32% of cases in a clinicopathological analysis of 103 cases, followed by the lower limb (26.2%) and the back (19.4%) (10). The head and neck region accounted for 62.2% of instances, while the back was the second most common place (10.1%), according to another review of 217 cases (10). Variations in healthcare-seeking behavior, occupational or environmental circumstances, and population characteristics may all contribute to this discrepancy. Patients are more likely to seek medical attention only after the cyst becomes symptomatic or infected since lesions on the back may go unnoticed for extended periods of time.

Chi-square analysis revealed no statistically significant association between site and infection ($p=0.15$), this suggests that infection may be influenced by multiple factors beyond location alone, including mechanical irritation, cyst size, duration before excision, and secondary bacterial colonization. These findings highlight the importance of early surgical excision of sebaceous cysts, particularly in anatomical areas prone to mechanical irritation, in order to reduce the risk of secondary infection.

The scalp and face were the second and third most common locations, accounting for 15.6% and 9.5% of cases, respectively. These sites also showed relatively high infection rates (52.2% and 50.0%). The higher prevalence of cysts in these areas may be attributed to the high density of sebaceous glands and hair follicles, which are known to predispose to the development of epidermoid cysts. In contrast, cysts located on the flank, neck, chest, and hand demonstrated lower infection rates. These variations may reflect differences in local mechanical factors, hygiene practices, or the time at which patients seek medical attention. In some cases, lesions located on visible areas such as the face may prompt earlier consultation, thereby reducing the likelihood of infection.

Post-COVID diversification (face/scalp rises to 26.8% combined) coincided with a modest infection drop (63.0%→49.5%), possibly from improved access reducing chronic inflammation, though back dominance persisted. (Table 2) These findings advocate site-stratified protocols—e.g., prophylactic antibiotics or occlusive dressings for trunk procedures—and highlight the value of local data in resource-limited settings (12).

Conclusion:

This epidemiological comparison of sebaceous (epidermoid) cyst excisions during the COVID-19 (2020-2021) and post-COVID (2022-2023) periods reveals significant shifts in surgical volumes and important insights into patient presentation characteristics. The data suggest a notable decrease in excisions during the pandemic, followed by a substantial rebound in the post-pandemic era. While patient demographics remained stable, the back emerged as the most common anatomical site for excisions, also exhibiting a high infection rate. Furthermore, a trend towards a higher proportion of infected cysts during the pandemic, though not statistically significant, highlights the potential impact of delayed care. These findings underscore the need for resilient healthcare systems capable of maintaining essential services during public health crises and emphasize the importance of timely medical consultation to prevent complications. Future research with real-world data is essential to confirm these trends and inform strategies for mitigating the effects of future healthcare disruptions.

Recommendations:

- Use prophylactic antibiotics for back/trunk excisions.
- Prioritize early drainage of inflamed cysts.
- Standardize post-op wound care and follow-up.
- Launch multi-center studies with microbiology data.

Data Availability: The corresponding author will provide all data sets collected for this work upon reasonable request.

Ethical Approval: Ethical approval was obtained from the hospital ethics committee, and the requirement for informed consent was waived due to the retrospective nature of the study.

Limitation: The sample size, particularly for the COVID-19 period, is relatively small, which may have limited the statistical power to detect significant differences in some variables, and being a single-center study, the findings may not be generalizable to other populations or healthcare systems with different pandemic responses and patient demographics.

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