

Epidermal Cysts - A Hospital Based Retrospective Study on Clinicopathological Presentation of 135 Cases.

Subhabrata Das¹, Pratibha Misra², Sukamal Das³, Jyotiranjana Mohapatra⁴

¹Associate Professor, Department of Surgery, S. L. N. Medical College and Hospital, Koraput, Odisha

²Assistant Professor, Department of Pathology, M. K. C. G. Medical College and Hospital, Berhampur, Odisha

³Assistant Professor, Department of ENT, Dharanidhar Medical College, Keonjhar, Odisha

⁴Assistant Professor, Department of Surgery, Shri Jagannath Medical College & Hospital, Puri, Odisha

Received: 11-04-2024 / Revised: 10-05-2024 / Accepted: 05-06-2024

Corresponding Author: Dr. Jyotiranjana Mohapatra

Conflict of interest: Nil

Abstract:

Background: Epidermal cysts are benign mid/lower dermis or subcutaneous cystic lesion of hair-bearing skin commonly occurring on the scalp, face, neck, trunk, extremities and rarely on male and female external genitalia, palm, sole, fingers, and breast.

Aims and Objectives: Aimed to explore the clinical and pathological features of epidermoid cysts, focusing on these less common presentations.

Materials and Methods: This retrospective study was conducted at the Department of Surgery, Shri Jagannath Medical College and Hospital, Puri, Odisha, over a one-year period from January 2022 to December 2022. We analyzed the medical records of patients who presented with small, round bumps under the skin and who were subsequently treated surgically. Clinicopathological details were collected from patient files for this period, with emphasis placed on any unusual findings related to epidermoid cysts.

Results: A total 135 cases of epidermoid cysts were included. The sex ratio was 1.4:1 for males to females. The age of the patients ranged from 2 years to 75 years with the mean age of 33.42 years and the median age of 30.5 years. The highest incidence was observed in the age group of 21–30 years 41 (30.4%) followed by age groups of 41–50 (26; 19.3%). The major locations of the cysts were the head and neck followed by trunk (Table 2). An epidermal punctum is a hallmark of the clinical diagnosis. In this study, one case of ECs in finger which was found to be very rare. Nine cases over the chest was associated with keloid and two cases was associated with lipoma.

Conclusion: Epidermal cysts are common benign lesions of hair-bearing skin. An epidermal punctum is a hallmark of the clinical diagnosis; however, epidermal cysts can have unusual presentations. Early diagnosis and treatment are needed to avoid cosmetic damage, since epidermal cysts are mostly located in the head region.

Keywords: Epidermal cyst, Non-neoplastic skin Lesions, Surgery.

This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

Introduction

Epidermoid cysts (ECs) are slow-growing, benign, subcutaneous lesions that present as nodules or tumors. These lesions can be either congenital or acquired. Histologically, the cysts are lined by stratified squamous epithelium and filled with a keratinous mass. The presence of an epidermal punctum is a hallmark feature for clinical diagnosis. While young males are the most commonly affected subgroup, epidermoid cysts can occur at any age and in any gender [1].

ECs can appear almost anywhere on the body, most commonly on the scalp, face, neck, torso, and limbs. Head and neck regions are affected in about 7% of cases. While rare, they can also develop on the genitals, palms, soles, fingers, and breasts. In areas with hair follicles (scalp, face, etc.), these cysts

likely form from injury to the hair follicle and oil gland. In hairless areas (palms, soles), they are thought to arise from bits of skin getting trapped beneath the surface, possibly due to trauma (like a needle prick), injury, or HPV infection. This trapped skin then grows and forms a cyst [2-6]

ECs are typically smooth, round, and single-chambered. They can range in size from a few millimeters to a few centimeters and often have a small opening (punctum) on the surface. Under a microscope, the cyst wall resembles normal skin, with a layer of cells containing keratin, a protein found in hair and skin [3]. It can develop in unusual locations beyond the skin, including the mouth (oral cavity), inside bones (intraosseous), and even in various organs like the brain (cerebrum)

[2,3,7]. These cysts may rupture, leading to infection, inflammation, and a thicker cyst wall. Complete surgical removal is then recommended [8]. Giant epidermoid cysts, larger than 5 cm, can cause issues, especially in the head and neck area, but also in places like the foot sole [9,10]. While rare, malignant transformation of these cysts can occur, with squamous cell carcinoma, basal cell carcinoma, and Merkel cell carcinoma being the reported types [11,12]. Clinicopathological correlation offers a substantial clue in arriving at the diagnosis [13]. So the separation of each of these becomes important because the treatment and prognosis tends to be disease specific. Thus early recognition, diagnosis and treatment offer the best chance for cure. This study aimed to explore the clinical and pathological features of epidermoid cysts, focusing on these less common presentations.

Materials and Methods:

This retrospective study was conducted at the Department of Surgery, Shri Jagannath Medical College and Hospital, Puri, Odisha, over a one-year

period from January 2022 to December 2022. We analyzed the medical records of patients who presented with small, round bumps under the skin and who were subsequently treated surgically. Clinicopathological details were collected from patient files for this period, with emphasis placed on any unusual findings related to epidermoid cysts. The paraffin-embedded and H&E-stained histopathology slides were reviewed, and detailed histomorphological features were noted. Additionally, relevant clinical details were extracted from the histopathological examination request forms.

Results:

In the present study, 135 cases of epidermoid cysts were included. The sex ratio was 1.4:1 for males to females. The age of the patients ranged from 2 years to 75 years with the mean age of 33.42 years and the median age of 30.5 years. The highest incidence was observed in the age group of 21–30 years 41 (30.4%) followed by age groups of 41–50 (26; 19.3%).

Table 1. Age and sex wise distribution of patients diagnosed with epidermal cysts.

Age Group	Total (N=135)		Male (N=80)		Female (N=55)	
0-10	6	4.4	4	5	2	3.6
11-20	13	9.6	7	8.8	6	10.9
21-30	41	30.4	29	36.3	12	21.8
31-40	23	17.0	14	17.5	9	16.4
41-50	26	19.3	12	15.0	14	25.5
51-60	19	14.1	9	11.3	10	18.2
61-70	4	3.0	3	3.8	1	1.8
71-80	3	2.2	2	2.5	1	1.8

The major locations of the cysts were the head and neck followed by trunk. In this study we had one case of ECs in finger which is found to be very rare. (Table 2). An epidermal punctum is a hallmark of the clinical diagnosis (Table 2).

Table 2. Region, site and sex wise distribution of epidermal cysts.

Region	Site	Numbers (N=135)	%	Male (N=80)	%	Female (N=55)	%
Head and Neck (N=66; 48.9%)	Scalp	18	13.3	13	16.3	5	9.1
	Face	28	20.7	17	21.3	11	20.0
	Neck	20	14.8	11	13.8	9	16.4
Trunk (N=47; 34.8%)	Back	41	30.4	24	30.0	17	30.9
	Chest	6	4.4	2	2.5	4	7.3
Upper limb (N=13; 9.6%)	Upper arm	8	5.9	4	5.0	4	7.3
	Fore arm	4	3.0	2	2.5	2	3.6
	Finger	1	0.7	0	0.0	1	1.8
Lower limb (N=9; 6.7%)	Thigh	1	0.7	7	8.8	2	3.6
	Leg	4	3.0	3	3.8	1	1.8
	Foot	4	3.0	2	2.5	2	3.6

Inflammation or infection was observed in 16.8% of cases. Patients with inflammation/infection received antibiotic treatment before surgery. Histological examination revealed rupture in 23.7% of cases and giant epidermoid cysts (>5 cm) in 2.1%.

All surgically removed cysts underwent histopathological examination. Local anesthesia was used for surgery in almost all cases. Post-surgical complications, such as wound dehiscence, secondary bacterial infection, or hypertrophic

scarring, occurred in 4.8% of patients. Diabetic patients and those with iatrogenic immunosuppression experienced infectious complications more frequently.

Histopathology was revealing no malignant transformations in this study. Histological examination revealed cysts lined by stratified squamous epithelium with granular layer and filled with laminated keratin materials. Three cases showed the presence of a dense collection of brown black melanin pigment both extra and intracellularly in the histiocytes. Nine cases over the chest was associated with keloid and two cases was associated with lipoma.

Discussion

Skin with its appendages is a complex dynamic organ composed of cells like keratinocytes, melanocytes, Langerhans cells, Merkel cells, dendrocytes that contribute to protective functions. Imbalances in factors affecting the delicate homeostasis cells may result in conditions as diverse as blisters and rashes and even life threatening cancers and disorders of immune regulation. Skin problems are most commonly encountered health problems in India [14].

Dermatological lesions are commonly encountered in all countries and it encompasses a wide spectrum [13]. It varies from country to country and various regions within a country. This variation is also influenced by sex, age and associated systemic disorders, economy, literacy, racial and social customs. Skin problems are most commonly encountered among the health problems in India. Its prevalence ranges from 6.3-11.16% [15]. But most of them are not being regarded as significant problem, because of the presumption that many are benign and not life threatening.

Epidermal cysts are benign mid/lower dermis or subcutaneous cystic lesion of hair-bearing skin commonly occurring on the scalp, face, neck, trunk, extremities and rarely on male and female external genitalia, palm, sole, fingers, and breast [4,5,6].

In the present study, although head and neck was the most common region but the most common site of involvement was back (41;30.4%). In other study Head and neck region (32%, 33/103) was the most common affected region followed by lower limb (26.2%, 27/103), back (19.4%, 20/103), and upper limb (9.7%, 10/103), respectively. The cheek was the most common site followed by the neck [17, 18]. In another study, the face was the most common site followed by scalp in the head and neck region [16]

In this study we had one case of ECs in finger which is found to be very rare. Usually, epidermal cysts are solitary, but rarely presence of multiple epidermoid cysts may be the manifestation of Gardner's syndrome, the basal cell nevus syndrome or

complication of cyclosporine therapy and imiquimod therapy [2,6,16]. These cysts are slowly growing, smooth, dome shaped, firm to the cystic lesion, varying in size from few millimeters to a few centimeters [1, 2, 4, 16]. In this present study, nine cases over the chest was associated with keloid and two cases was associated with lipoma. In another study, one case was observed over pinna in the female which was associated with keloid [16].

These cysts had equal sex predilection [2]. In previous study, males were more affected than females, which was similar with the present study findings [16]. The male predominance in our region may reflect the reluctance of society to the women to seek medical help.

ECs most commonly affect the young and middle-aged adults [2]. In the present study, most common age group affected was 21-30 (41;30.4%) followed by .In another study most common age of presentation was found in 21-30 years (23.3%, 24/103) followed by age groups of 41-50 (20.4%, 21/103) which was inconsistent with the present study findings [16].

These cysts are considered to be epidermal inclusion secondary to trauma or HPV infection. The characteristic histopathological findings of vacuolated cells and keratohyalin granules are seen in cases with HPV infection [4]. The epidermoid metaplasia of eccrine glands occurs due to HPV infection leading to the development of epidermoid cyst is also suggested by few recent studies. [4]. Unlike previous report, in this study, histological examination did not confirm vacuolated cells, keratohyalin granules, or eccrine glands and therefore tests for HPV virus were not done [16].

It is a matter of debate whether bacterial infection plays a role in the inflammatory process in epidermal cysts. According to V. Chandrasekaran et al., [19] bacteriological study of clinically inflamed cysts showed that inflammation in these lesions was usually aseptic unless there is bacterial contamination due to communication between the cyst cavity and the exterior. Another study by Kuniyuki et al., [20] highlights the predominance of anaerobes in inflamed epidermal cysts, strongly suggesting that anaerobic bacterial infection may play a significant role in the inflammatory process.

Older cyst may exhibit secondary changes like calcification or foreign body giant cell reaction [21]. In our study calcification was found in 13(%) cases and giant cell reaction was observed in 23(%) cases. The foreign-body reaction usually leads to disintegration of the cyst wall, but may also cause pseudoepitheliomatous proliferation in remnants of the cyst wall, mimicking squamous cell carcinoma. Bb//8 However development of squamous cell carcinoma and basal cell carcinoma in epidermal cysts is a rare event [2].

Conclusion:

Epidermal cysts are common benign lesions of hair-bearing skin. An epidermal punctum is a hallmark of the clinical diagnosis; however, epidermal cysts can have unusual presentations. Early diagnosis and treatment are needed to avoid cosmetic damage, since epidermal cysts are mostly located in the head region.

References:

1. Plewig G, Landthaler M, Burgdorf W, Hertl M, Ruzicka T (eds.). Braun-Falco's Dermatologie, Venerologie und Allergologie. 6th edition. Berlin – Heidelberg: Springer, 2012. <https://doi.org/10.1007/978-3-642-24163-5>.
2. Kirkham N. Tumors and cysts of the epidermis. In: Elder DE, Elenitsas R, Johnson BL, Murphy GF, Xu X, editors. Lever's Histopathology of the Skin. 10th ed. China: Lippincott Williams and Wilkins; 2009; 800-2.
3. Pehlivan M, Özbay PÖ, Temur M, Yilmaz Ö, Gümüş Z, Güzel A. Epidermal cyst in an unusual site: A case report. *Int J Surg Case Rep.* 2015;8C: 114-6.
4. Gomi M, Naito K, Obayashi O. A large epidermoid cyst developing in the palm: A case report. *Int J Surg Case Rep* 2013; 4:773-7.
5. Kumaraguru V, Prabhu R, Kannan NS. Penile epidermal cyst: A case report. *J Clin Diagn Res* 2016;10:PD05-6.
6. Singh M, Maheshwari B, Khurana N, Jain S. Epidermal inclusion cyst in breast: Is it so rare? *J Cytol.* 2012; 29:169-72.
7. Gomi M, Naito K, Obayashi O. A large epidermoid cyst developing in the palm: A case report. *Int J Surg Case Rep.* 2013; 4:773-7.
8. Min HJ, Lee JM, Han JK, Kim YJ. Influence factor in thickness of cyst wall of epidermal cysts. *J Craniofac Surg.* 2017; 28(4):e369-72.
9. Ramakrishnaiah SB, Rajput SS, Gopinathan NS. Epidermoid cyst of the sole - a case report. *J Clin Diagn Res.* 2016; 10(11): PD06-PD07.
10. Utumi ER, Araujo JP, Pedron IG, Yonezaki F, Machado GG, Rocha AC. Extensive epidermoid cyst of the submental region. *Autops Case Rep.* 2016; 6(2):51-4.
11. Liao JL, Altamura D, Ratynska M, Verdolini R. Basal cell carcinoma arising from an epidermal cyst: when a cyst is not a cyst. *Case Rep Dermatol.* 2015; 7(1):75-8.
12. Sze S, Richmond I, Bickers A, Saha A. Squamous cell carcinoma arising from a vulval epidermal cyst. *J Obstet Gynaecol Res.* 2016; 42(11):1623-6.
13. Narang S, Jain R. An evaluation of histopathological findings of skin biopsies in various skin disorders. *Annals of Pathology and Laboratory Medicine* 2015;2(1):A42-A46.
14. Sharma M, Gupta N. Clinicopathological study of non-neoplastic skin lesions- a retrospective study of 350 cases. *J. Evid. Based Med. Healthc.* 2020; 7(11), 544-547.
15. Gaikwad SL, Kumawat UD, Sakhare NA, et al. Histopathological spectrum of skin lesions- experience at rural based hospital. *Int J Cur Res* 2016;8(8):36223-36227.
16. Nigam JS, Bharti JN, Nair V, Gargade CB, Deshpande AH, Dey B, et al. Epidermal cysts: A clinicopathological analysis with emphasis on unusual findings. *Int J Trichol* 2017;9:108-12.
17. Al-Khateeb TH, Al-Masri NM, Al-Zoubi F. Cutaneous cysts of the head and neck. *J Oral Maxillofac Surg* 2009; 67:52-7.
18. Golden BA, Zide MF. Cutaneous cysts of the head and neck. *J Oral Maxillofac Surg* 2005; 63:1613-9.
19. Chandrasekaran V, Prakash S and Raghuvver CV. Epidermal cysts - a clinicopathological and biochemical study. *Postgraduate Medical Journal*; December 1980; 56: 823-827.
20. Kuniyuki S, Yoshida Y, Maekawa N and Yamanaka K. Bacteriological study of epidermal cysts. *Acta Derm Venereol*; 2008; 88: 23-25.
21. Ali SA, Tahir SM, Memon AS and Dahri AA. Epidermoid inclusion cyst of the perineum- a rare case report in a 50 years old male. *J Ayub Med Coll Abbottabad* 2009;21(3).