

## Ocular caruncular lesions: A clinicopathological study

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### Abstract

**Introduction:** A pink oval structure, the ocular caruncle is a modified cutaneous tissue located at the inner canthus of the eye, medial to the plica semilunaris. By virtue of its tissue diversity, ocular caruncle can give rise to a wide variety of lesions including both non neoplastic and neoplastic and although most of them are benign, clinical diagnosis may be difficult.

**Aim:** To study the incidence and describe clinical and histopathological features of ocular caruncular lesions.

**Materials and Method:** This is a retrospective study of ocular caruncular lesions from the archives from 2006 to 2010 were analyzed both clinically and histopathologically.

**Results:** A total of 22 lesions were analyzed. Thirteen (59.09%) of the patients were women and 9 (40.90%) were men and the age range from 25 to 67 years. The main diagnoses were: inflammatory lesions (11 cases), epithelial lesions/tumors (8 cases), melanocytic lesions (2 cases), and a lymphoid lesion (one case). Out of 22 cases, preoperative clinical diagnosis was concordant with histopathological evaluation in 16 cases (72.72%). Most common caruncular lesions were chronic inflammatory followed by epithelial lesions/tumors and melanocytic lesions. Although most of the lesions were benign, clinically most of the lesions are disguising in nature.

**Conclusion:** Ocular caruncular lesions are most commonly inflammatory, less common lesions being epithelial and melanocytic lesions. Some benign lesions are clinically overestimated as 'malignant' and some malignant lesions are underestimated as 'benign', justifying close pathological work-up of all lesions.

**Keywords:** Ocular caruncle

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### Introduction

A pink oval structure, the caruncle is a modified cutaneous tissue located at the inner canthus of the eye, medial to the plica semilunaris. The conjunctiva and its associated elements, the caruncle and the plica semilunaris, form a smooth, flexible protective sac that covers the pericorneal surface of the eye and lines the posterior surface of the eyelids.<sup>(1)</sup> The caruncle is a transition zone combining mucous membrane and adnexal elements. The epithelial and sub epithelial components of the caruncle reflect the partial derivation of this structure from the eyelid. The epithelium is thick and of the nonkeratinized stratified squamous type. The stroma contains fibroblasts and melanocytes interspersed with collagen, sebaceous glands, hair follicles, and striated muscle fibers derived from the orbicularis oculi muscle (Horner's muscle). In some individuals, serous glandular elements are found.<sup>(1,2)</sup> These different types of tissues can give rise to a wide variety of lesions; most of them benign, but the variety of lesions that affect the caruncle make the clinical diagnosis difficult.<sup>(3,4,5,6)</sup> Various studies observed inconsistency between clinical and histopathological diagnosis of ocular caruncular lesions.<sup>(3,5,6,7,8,9)</sup>

The present study is done to determine the frequency and describe the histopathological features of ocular caruncular lesions over a 5-year period.

### Materials and Method

This is a retrospective study. The records of ocular caruncular lesions from our archives from 2006 to 2010 were analyzed both clinically and histopathologically. The lesions were classified by histological type. The lesions were correlated with clinical data, preoperative clinical diagnosis, histopathological diagnosis, follow up details and outcome.

### Results

A total of 22 lesions were analyzed. Majority of patients were females (59.09%, 13 cases) with male: female ratio being 1.44:1 and the age ranged from 25 to 67 years. The most common (68.18%, 15 cases) clinical diagnosis was neoplasm. The most common histopathological diagnosis was inflammatory lesions (50%, 11 cases), followed by epithelial tumors/lesions (36.36%, 8 cases), melanocytic lesions (9.09%, 2 cases) and the least being lymphoid lesion (4.54%, 1 case). 72.72% (16 cases) of pre operative clinical diagnosis were concordant by histopathological evaluation. The results were categorized in to four different heading namely; inflammatory lesions, epithelial lesions/tumor, melanocytic lesions and lymphoid neoplasm (Table 1).

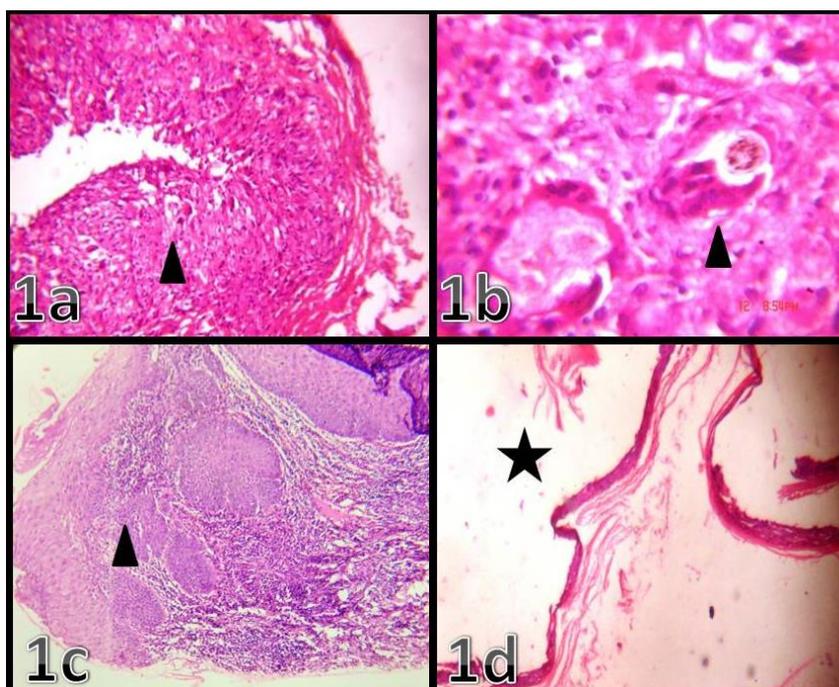
Macroscopically excised specimen ranged from 2.8mm x 2 mm x 1.5 mm to 10mm x 6mm x 5mm, were gray white to gray pink and with soft to firm

consistency. Some were cystic and some were homogeneous gray white on cut surface (Fig.).

**Inflammatory lesions:** Men and women were equally affected with mean age of 33.5 years. Most common lesion was chronic nonspecific inflammatory lesion (45.45%, 5 cases), followed by inflammation with epithelial hyperplasia (36.36%, 4 cases) and least being granulomatous (18.18%, 2 cases) (Table 1). The most commonly observed non specific chronic inflammatory lesions were clinically mistaken for neoplastic process in all 5 cases due to their chronicity and lack of acute inflammatory symptoms/ signs. All were recovered completely upon management except a case of

granulomatous lesion which spread to CNS and died from tubercular meningitis after one year.

*Microscopically* lesions showed dense mixed inflammatory cells infiltration rich in lymphocytes with foci of granulation tissue. Granulomatous lesions showed scattered epithelioid cells, poorly formed granulomas, with mixed inflammatory cells infiltration including multinucleated foreign body type giant cells (Fig. 1a). Some multinucleated giant cells showed ingested trichoid structure (Fig. 1b). But necrosis was absent. Most lesions showed denuded overlying stratified squamous epithelium but some showed epithelial hyperplasia (Fig. 1c).



**Fig. 1:** Showing chronic granulomatous inflammation with multinucleated giant cells (black arrow head) with mixed inflammatory cells infiltration (1a) [H&E, x10]; some multinucleated giant cells ingested trichoid structure (black arrow head) (1b) [H&E, x40]; chronic inflammation with epithelial hyperplasia (black arrow head) (1c) [H&E, x10]; eccrine cyst/ hidrocystoma less loculated (black asterisk) (1d) [H&E, x10]

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**Epithelial lesions/ tumors:** Men and women were equally affected with mean age of 49.75 years. Most common epithelial lesion encountered were epidermoid cyst (37.5%, 3cases) followed by single case each (12.5%) of eccrine cyst, sebaceous adenoma,

intraepithelial dysplasia, basal cell carcinoma and squamous cell carcinoma. One case of pre-malignant lesion (intraepithelial dysplasia) was diagnosed and recovered upon follow up evaluation after complete excision.

*Microscopically* cystic lesions showed sub epithelial location, lined by keratinized stratified squamous epithelium and filled with keratin material and often with granulomatous response in the wall. Some cystic lesions showed less loculated sub epithelial cysts (Fig. 1d) of varying size lined by few layers of cells but most striking is apical snouting of luminal cells and attenuated outer basaloid cells but with sparse inflammatory cells in the intervening stroma. Some showed closely packed nests comprised of central

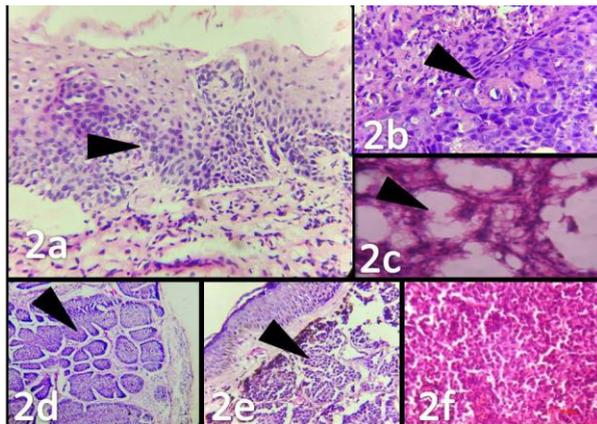
sebaceous cells often with central softening and cystic change and outer basaloid cells but with absence of orderly maturation (Fig. 2c). Some epithelial lesions showed intraepithelial dysplasia occupying lower third to half of epithelium which showed varying degree of hyperplasia but with intact basement membrane (Fig. 2a). Squamous cell carcinoma showed irregular sheets and islands of dysplastic cells and scattered individual cells showing keratinization (Fig. 2b). Basal cell carcinoma showed typical sub epithelial nests of basaloid cells with characteristic peripheral palisading (Fig. 2d).

**Melanocytic lesions:** All cases were females with mean age 28years. Two cases of melanocytic lesion were encountered one is superficial nevus and other was compound nevus. Superficial nevus recovered and cured after complete excision. Compound nevus was lost for follow up.

*Microscopically* lesions showed sub epithelial nests of nevoid cells often with increase in the basal layer melanocytes. But none of them showed junctional activity (Fig. 2e).

**Lymphoid tumor:** A single case of Non Hodgkin's lymphoma (1 case, age 38yrs) was clinically misdiagnosed as benign neoplasm and lost for follow up after biopsy.

*Microscopically* lesion showed monotonous population of small to medium sized lymphoid cells with scattered histiocytes (Fig. 2f).



**Fig. 2: Showing (2a) intraepithelial dysplasia occupying lower half of epithelium (black arrow head) [H&E, x40]; (2b) squamous cell carcinoma with individual cell keratinisation (black arrow head) [H&E, x40]; (2c) sebaceous adenoma with closely packed nests with central sebaceous cells (black arrow head) [H&E, x100]; (2d) basal cell carcinoma with nests of basaloid cells with peritumoral lacunae (black arrow head) [H&E, x10]; (2e) intradermal nevus with nevoid cells in nests (black arrow head) [H&E, x40]; (2f) non hodgkin's lymphoma with monotonous lymphoid cells**

Fig. 2 showing (2a) intraepithelial dysplasia occupying lower half of epithelium (black arrow head) [H&E,

x40]; (2b) squamous cell carcinoma with individual cell keratinisation (black arrow head) [H&E, x40]; (2c) sebaceous adenoma with closely packed nests with central sebaceous cells (black arrow head) [H&E, x100]; (2d) basal cell carcinoma with nests of basaloid cells with peritumoral lacunae (black arrow head) [H&E, x10]; (2e) intradermal nevus with nevoid cells in nests (black arrow head) [H&E, x40]; (2f) non hodgkin's lymphoma with monotonous lymphoid cells.

**Table 1: Detailed Clinical and Histopathological Classification and clinical outcome of the ocular caruncular lesions**

Category of lesion	Histopathological diagnosis	Pre biopsy clinical diagnosis	Number	mean age (y)	age range (y)	Male (No, %)	Female (No, %)	Treatment	Fallow up
Inflammatory Lesions	Chronic inflammation	Neoplasm	5	36	31-58	3, 60%	2, 40%	E, A	Recovered
	Inflammation and epithelial hyperplasia	Inflammatory lesion	4	29	27-31	2, 50%	2, 50%	E, A	Recovered
	Granulomatous inflammation	Inflammatory lesion	2	36.5	32 and 41		2, 100%	E, AT	One case died from tubercular meningitis after 1 year of biopsy
Epithelial Tumors/ lesions	Epidermoid cyst/epithelial inclusion cyst	Neoplasm	3	37	30-45	2, 66%	1, 33%	E, A	Recovered
	Eccrine cyst	Neoplasm	1	45	-		1, 100%	E, A	Recovered
	Sebaceous adenoma	Neoplasm	1	54	-		1, 100%	E, A	Recovered
	Intraepithelial dysplasia	Inflammatory lesion	1	65	-	1, 100%		E, A	Recovered, no fresh growth /lesion after 1 year
	Basal cell carcinoma	Neoplasm	1	55	-	1, 100%		E, A	Recovered
	Squamous cell carcinoma	Neoplasm	1	67	-		1, 100%	E, A	Last for fallow up
Melanocytic Lesions	Superficial nevus	Neoplasm	1	32	-		1, 100%	E, A	Recovered
	Compound nevus	Neoplasm	1	25	-		1, 100%	E, A	Last for fallow up
Lymphoid Tumors	Non Hodgkin's lymphoma	benign neoplasm	1	38	-		1, 100%	PE, A, R	Last for fallow up
Total			22			9, 40.9%	13, 59.09%		

Abbreviations: E- excision, A- Antibiotics, AT- antitubercular therapy, R- Radiotherapy, PE- partial excision/ diagnostic biopsy

## Discussion

The ocular caruncle harbors variety of tissue types including epithelial, adnexal, mesenchymal, neural and hence can give rise to variety of lesions both neoplastic and non neoplastic.<sup>(1,3)</sup> Most tumors that arise in the adnexal structures of the eyelids, eyebrows, and orbit may also originate in the caruncle.<sup>(5)</sup> The clinical differential diagnosis includes benign and malignant tumors caused by melanocytic, epithelial, inflammatory, lymphocytic and vascular lesions.<sup>(5,8,9,10,22)</sup> The rarity and variety of caruncular lesions make clinical diagnosis difficult. Some caruncular lesions are clinically overestimated as malignant and yet some malignant lesions are underestimated clinically as being benign.

Most studies including study by Luthra et al, Kaeser et al, Levy et al, Ostergaard et al, Helena P S et al and the present one observed inconsistency between clinical and histopathological diagnosis, which can be as high as 50%.<sup>(3,5,6,7,8,11,22)</sup> In the present study discordant rate was 27.27% (6 cases). Most studies found melanocytic lesions as the commonest caruncular lesions while it was inflammatory lesion in the present study (Table 2). Most studies including the present one observed epithelial lesions as the second most common lesion (Table 2).<sup>(3,6,7,8,22)</sup> Melanocytic lesions were the less commonly observed lesions in the present study. Most of the tumors of caruncle are benign.<sup>(22)</sup> The malignant tumors are rare.<sup>(5,22)</sup> Most of the diagnosed caruncular non melanocytic tumors were benign as observed by various studies. Ostergaard et al observed most (96%) of the diagnosed tumors in their study being benign.<sup>(11)</sup> Majority (72.72%, 8 cases) of the tumors in the present study were benign and only minority (27.27%) being malignant. Our reports demonstrated a lower incidence of melanocytic tumors than previous published data with a higher incidence of inflammatory causes, followed by epithelial tumors (Table 2).

**Table 2: Showing frequency of ocular caruncular lesions in the present study and in various other studies**

Type of lesion	Present study (%)	Sheild's et al (%)	Santos et al (%)	Kaeser et al (%)	Levy et al (%)	Luthra et al (%)
<b>Inflammatory lesion</b>	<b>50</b>			6.7		
• Chronic non specific	22.72	-	0.9	-	4.8	4.4
• With epithelial hyperplasia	18.18	-	-	-	-	-
• Chronic granulomatous	9.09	-	-	-	-	2.7
<b>Epithelial lesion</b>	<b>36.36</b>					
• Epidermoid cyst	13.63	7	15.1	5.1	-	3.6
• Eccrine cyst/hidrocystoma	4.54	-	-	0.5	-	0.9
• Sebaceous adenoma	4.54	1.8	1.8	1	2.4	-
• Intraepithelial dysplasia	4.54	-	-	1	2.4	-
• Basal cell carcinoma	4.54	1.8	-	1	2.4	-
• Squamous cell carcinoma	4.54	1.8	-	-	-	-
<b>Melanocytic lesion</b>	<b>9.09</b>	24.6	33.7	47.2	59.5	-
<b>Lymphoid lesion</b>	<b>4.54</b>	1.8	0.9	0.5	-	-

Several types of inflammatory processes have been described in the caruncle. Among them, the most frequently reported in the large series of caruncle lesions are chronic granulomatous inflammation, lipogranulomatous inflammation, and foreign body granuloma.<sup>(3,5,6,22)</sup> Other rarest inflammatory process described in literature are methicillin-resistant *Staphylococcus aureus* abscess,<sup>(12)</sup> inflammatory pseudotumor,<sup>(13)</sup> cytomegalovirus infection,<sup>(14)</sup> molluscum contagiosum,<sup>(15)</sup> spherulocystosis,<sup>(16)</sup> and Armillifer armillatus infection.<sup>(17)</sup> In our series chronic non specific inflammatory lesions are clinically misdiagnosed as neoplastic due to long standing history and absence of signs/symptoms of inflammation. These five cases got cured after successful management by antibiotics and environmental modification. A single case of tubercular lesion was reported and died after by tubercular meningitis. This case emphasizes the need of early recognition and accurate timely management.

Epithelial cysts are lesions more frequently encountered at the caruncle in one large series.<sup>(18)</sup> Other rare epithelial cysts described in the caruncle are

apocrine hidrocystoma and steatocystoma.<sup>(19)</sup> Treatment consists of simple excision with removal of the intact cyst wall to reduce the risk of recurrence.

The present study observed 3 malignant tumors (including: squamous cell carcinoma, low grade basal cell carcinoma and non Hodgkin's lymphoma) and only one case of moderate epithelial dysplasia, in which dysplastic changes were observed in the middle thirds of the conjunctival epithelium and was clinically suspected to be inflammatory nature. The invasive squamous cell carcinoma and moderate dysplasia should be included under the entity 'ocular surface squamous neoplasia (OSSN)' which encompasses precancerous and cancerous epithelial lesions of conjunctiva and cornea. OSSN includes spectrum of dysplasia, carcinoma in situ and invasive squamous cell carcinoma. The risk factors associated with OSSN include sunlight exposure, human papilloma virus type 16 infections, immuno compromised state and xeroderma pigmentosum.<sup>(23)</sup> Basal cell carcinoma has been reported to affect the caruncle. Basal cell carcinoma of the caruncle may originate from basal

cells of the epithelium or infundibular cells of the hair follicles or from pluripotent stem cells.<sup>(20)</sup> Surgical removal of caruncular basal cell carcinoma with clear surgical margins can be sometimes difficult. Micrographic surgery in selected cases may preserve more normal tissue than conventional surgery with less reported rates of recurrence.<sup>(21)</sup>

Caruncular melanoma is associated with poor prognosis and all pigmented lesions should be evaluated and monitored carefully. In the absence of clear criteria for malignancy, any change in color, size, or vascularization of a caruncular lesion should be subjected for histopathological examination.<sup>(7)</sup> In the present study compound nevus was clinically suspected as malignant lesion and last for follow up evaluation.

Myeloproliferative and lymphoproliferative lesions rarely involve ocular caruncle. Some studies observed benign lymphoid hyperplasia as the most common lympho proliferative lesion and accounted for about 3% of all caruncular lesions. Only a minority show Non Hodgkin's lymphoma. Usually they are slowly growing salmon colored lesions. About 30% of these will show associated systemic lymphoma. This emphasizes the need of early recognition of these ocular lymphoid tumors and long term follow up is required as related systemic lymphoma may develop years later.<sup>(3,4,6)</sup>

## Conclusion

Ocular caruncular lesions are most commonly inflammatory, less common lesions being epithelial and melanocytic lesions. Some benign lesions are clinically overestimated as 'malignant' and some malignant lesions are underestimated as 'benign', justifying close pathological work-up of all lesions. Because of their variety and rarity of high grade lesions, accurate clinical diagnosis of ocular caruncular lesions is difficult, necessitating the need for thorough histopathological evaluation to establish accurate diagnosis and for proper management.

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