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Clinicopathological study of Rhinoscleroma with Mast cell profile

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***Abstract*- Background and objectives:** Diagnosis of rhinoscleroma depends on histopathological examination of the tissue. Objective was to study the correlation between the clinical presentation, histomorphological changes and significance of mast cell distribution in various types of rhinoscleroma.
Method: A total of 55 cases of rhinoscleroma were studied. Microscopically the cases were divided into 3 types. Mast cells were counted in 10 high power fields after staining the slide with Toluidine blue
Results: 51.9% of the cases were cellular type, 25.1% were mixed type and 23% were fibrous type. Mast cells were increased significantly in mixed type as compared to control. Cellular and fibrous types also showed a significant increase.
Conclusion: Rhinoscleroma has an occurrence in north Karnataka, and that mast cell alteration has a possible significance.

***Index Terms*-**Rhinoscleroma, Mast cells

I. INTRODUCTION

Rhinoscleroma is a chronic infectious granulomatous disease of respiratory tract caused by Klebsiella rhinoscleromatis[1].
Von Hebra and Kohn described the first case in 1870[2] but Von Frish[3] in 1882 first detected the causal agent, i.e. Klebsiella Rhinoscleromatis. The term rhinoscleroma is now replaced by scleroma, as it is not necessarily confined to nose. Airborne disease transmission requires prolonged contact[4]. There is no gender prevalence and the young adults in the second or third decades are most commonly affected[5].
Rhinoscleroma has a worldwide distribution. Wahi and Misra in 1964[6] reviewed the problem of rhinoscleroma and pointed out that the disease is not uncommon in our country and is prevalent in the Northern and Central parts of India above the line joining Bombay to Vishakapatnam. It is considered worthwhile to look into the spectrum of rhinoscleroma in North Karnataka area.
Mast cells were first described by Paul Ehrlich in 1877[7]. Mast cells have been studied in various breast lesions. The proliferation of mast cells, have been associated with the fibroblastic proliferation[8].
Thus this study was taken up to look for mast cell alterations in various histological types of rhinoscleroma.

II. MATERIALS AND METHODS:

This was a retrospective study of 55 case of rhinoscleroma received in department of pathology, MR Medical College, Gulbarga. The cases were analysed with regards to age and sex distribution and geographic area.
Biopsy specimens were fixed in 10% formalin and processed for routine paraffin sections and stained with hematoxylin and eosin. Grams stain and PAS stain were done in selected cases. Toluidine blue staining was performed for mast cells.
Microscopically the cases were divided into three types depending upon the cellular pattern and fibrovascular tissue pattern into mixed (catarrhal) type, cellular (granulomatous/ proliferative) type, and fibrous (fibrotic) type.

Method of mast cell counting:

Mast cell count was done on sections stained with toluidine blue. The mast cells in 10 high power fields were counted in the sub-epithelial zone of the 3 types of rhinoscleroma. For comparison the nasal mucosa from the autopsies was obtained to provide 6 control cases. The results were tabulated and statistically evaluated.

III. RESULTS:

Fifty five cases of rhinoscleroma were studied. These cases affected mainly the nose and the adjoining nasopharynx. The age range was 6-80 years with a mean age of 29.4yrs. The oldest patient was of 80 years old and the youngest was 6 years old. 63.6% of the cases were in the age group of 10-30yrs, 16.36% of cases in 30-40 age group and 14.42% of cases in 40-50 age group. There was a female preponderance (65.4 %) of the cases. The observed cases were coming from all the 3 districts of north Karnataka, without any particular focus.
The major clinical presentation was nasal obstruction in 29 cases(54%), difficulty in breathing 15 cases(21%), epistaxis in 8 cases(13%) and ulceration in 3 cases(6%). Bilateral presentation was a common finding seen in 33 cases(60%).

Gross appearance:

The biopsy specimens were greyish white on appearance and varied in consistency from soft to firm.

Histopathological features:

Epithelium showed squamous metaplasia in 45(81%) cases, hyperkeratosis in 7(12.6%), cases, atrophy in 20(36%) cases and ulceration in 6(10.8%) cases. Pseudoepitheliomatous hyperplasia was not seen in any of the sections.

Sub-epithelial tissue was edematous in 20(36%) cases and showed mild focal haemorrhages in 27(48.6%) cases.

Mikulicz cell infiltration was observed in all the cases. There was variation in number and distribution from case to case. They were plenty in cellular and mixed types, and sparse in fibrous type of rhinoscleroma. Lymphocytes and plasma cells were seen consistently along with Mikulicz cells. Two(3.6%) cases showed lymphoid follicles. Few polymorphs were seen in 28(50.4%) cases. Occasional eosinophils were seen in 3(5.4%) cases. Russell bodies were observed in 26(46.8%) cases.

There was a variable amount of fibrovascular stroma resulting in formation of fibrous bands at places. An occasional mild vasculitis was found in only 2(3.6%) cases.

The 55 cases in the present study were categorized into cellular type 28 cases (51.9%)(fig.1), mixed type 14 cases (25.1%)(fig.2) and fibrous type 13 cases (23%)(fig.3).

The mast cell count in control was 6.1 ±2.1. There was an increase in mast cell count in all the three types of rhinoscleroma(fig.4). Mast cells were frequently observed in mixed type 25.8±1.25. In the cellular type they were 14±1.5, and in fibrous type 9.4±1.8. There was a significant increase of mast cells in mixed type as compared to control ($P < 0.001$). Mast cells were also significantly increased in the cellular and fibrous types ($P<0.01$).

Majority of cases showed improvement with antibiotic therapy. Recurrence was seen in 8(15%) of the cases.

IV. DISCUSSION:

The present study highlights the occurrence of rhinoscleroma in the 55cases. 63.3% of the cases in the present study were in the age group of 10-30 years. This is similar to the majority of the cases reported by Talvalkar GV[9], and Malur et al.[10].

Several studies have reported a female predominance[11]. In the present study 65.38% of the patients were females showing a female predominance.

The site of involvement was nose in all the cases in this study. No extra nasal involvement was seen. Where as many authors have quoted extranasal involvement[9,10].

Nasal obstruction, difficulty in breathing, and epistaxis were the commonest symptoms presented by the patients in the present study. This has been the experience of Talvalkar GV[8], and Malur et al.[10].

Histologically squamous metaplasia was the frequent finding in the present study. The same has been noted by Malur et al.[10] and Poul RM et al.[12].

Mickulicz cells are not pathognomonic but are characteristic[13]. A chronic inflammatory infiltration of monocytes and lymphocytes has also been described[14]. Lymphomonuclear infiltrate in the form of lymphoid follicles was observed in 2 cases.

In the present study mast cells were increased in all the 3 types of rhinoscleroma, but more significantly in cellular and fibrous types, as compared to the controls.

Trogocytosis the controlling process in the formation of connective tissue is one of the most important functions subserved by mast cells[15]. Recurrent fibrovascular lesions have been reported to be directly or indirectly associated with the mast cell alterations. Walden Storm, reported that an increase in mast cells occurs before fibroplasias.

Using mast cells from the dog mastocytomas it was found that the addition of mast cells to a culture of fibroblasts appeared to favour the formation of silver staining fibres near the growing fibroblasts. This supports the idea that in vivo mast cells and fibroblasts may likewise interact in the formation of fibres.

It is assumed that mast cells participate in the formation of connective tissue particularly inflammatory granulomas and scar tissues. The mast cells have been implicated also in the formation of ground substance and hyaluronic acid[16].

It is thought that the mast cells stimulate wound healing, presumably through the formation of heparin which plays a role in the formation of collagen by fibroblasts[17].

The present study focusing hither to unhighlighted facet of rhinoscleroma is interesting and deserves explanation to the effect.

Waxing and waning course and recurrences in rhinoscleroma have been documented[12]. Of the various factors contributing to it, mast cells alterations may be one aspect of it, since the recurrent fibrovascular lesions like pterygium have been documented to be associated with mast cell alteration[8].

Desmoplastic tumors like schirrous carcinoma of breast, fibroadenomas and mammary dysplasias reveal an increase in mast cells and might suggest an important role of mast cells in host tumor interaction and desmoplastic reactions. In the light of these facts, one can understand the mast cell alteration in rhinoscleroma and its possible significance.

Though there are several studies in rhinoscleroma a number of questions still remain unanswered. Why does the organism frequently persist despite therapy? Are the macrophages incapable of ridding the host of intracellular bacteria? Why is that, the upper respiratory tract especially the nose is so frequently affected in relation to rhinoscleroma? Would immune modulation help in the therapy of rhinoscleroma? Based on these queries, a well planned research may raise the curtain on several unclear facts of rhinoscleroma.

V. CONCLUSION

The present study highlights the occurrence of rhinoscleroma in Northern Karnataka. It tries to project a spectrum of clinical and histological changes and mast cell alterations in rhinoscleroma, which signifies a pre fibrotic phase.

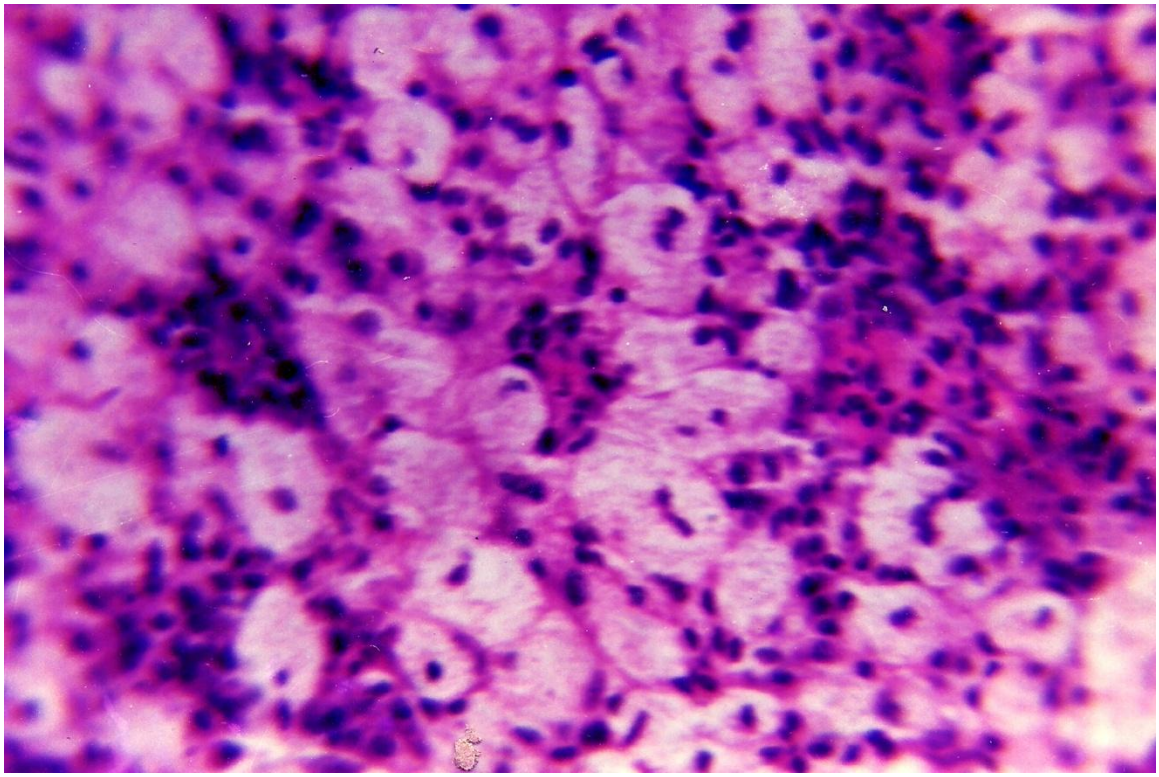

Figure 1: Cellular rhinoscleroma showing Mickulicz cells and eosinophils. H&E stain x1000

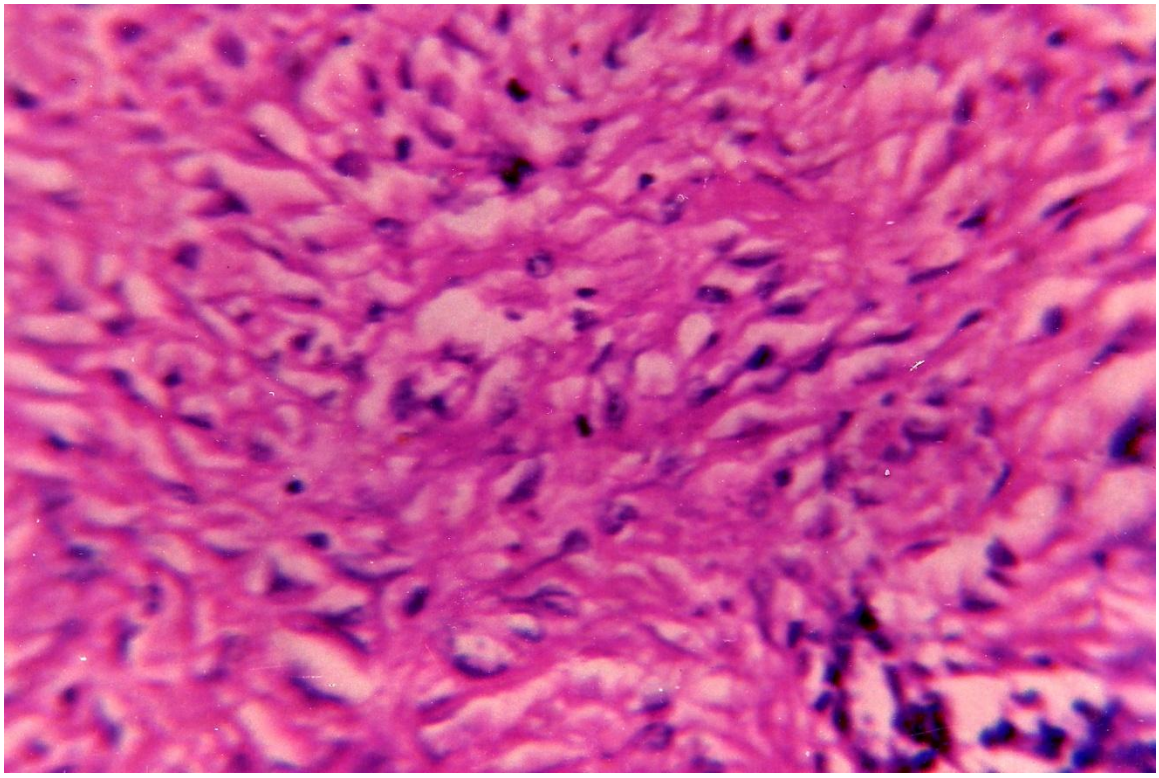

Figure 2: Fibrotic rhinoscleroma. H&E stain x400

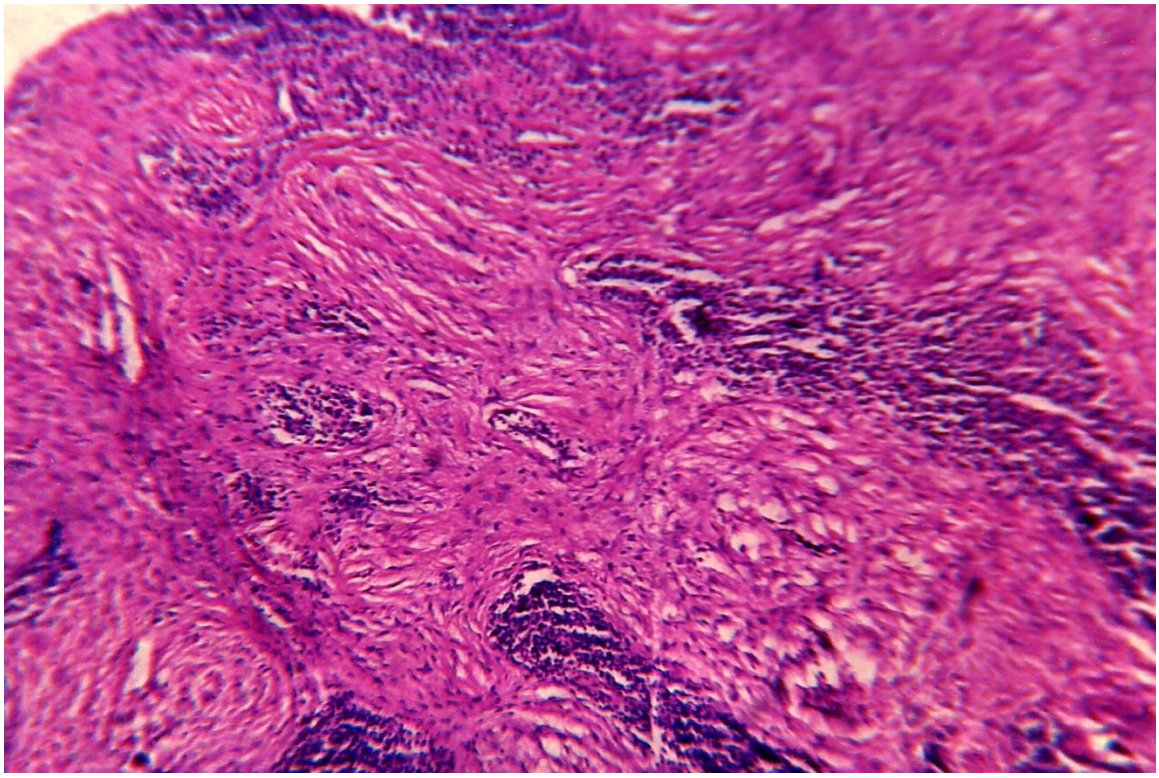

Figure 3: Mixed rhinoscleroma. H&E stain x400.

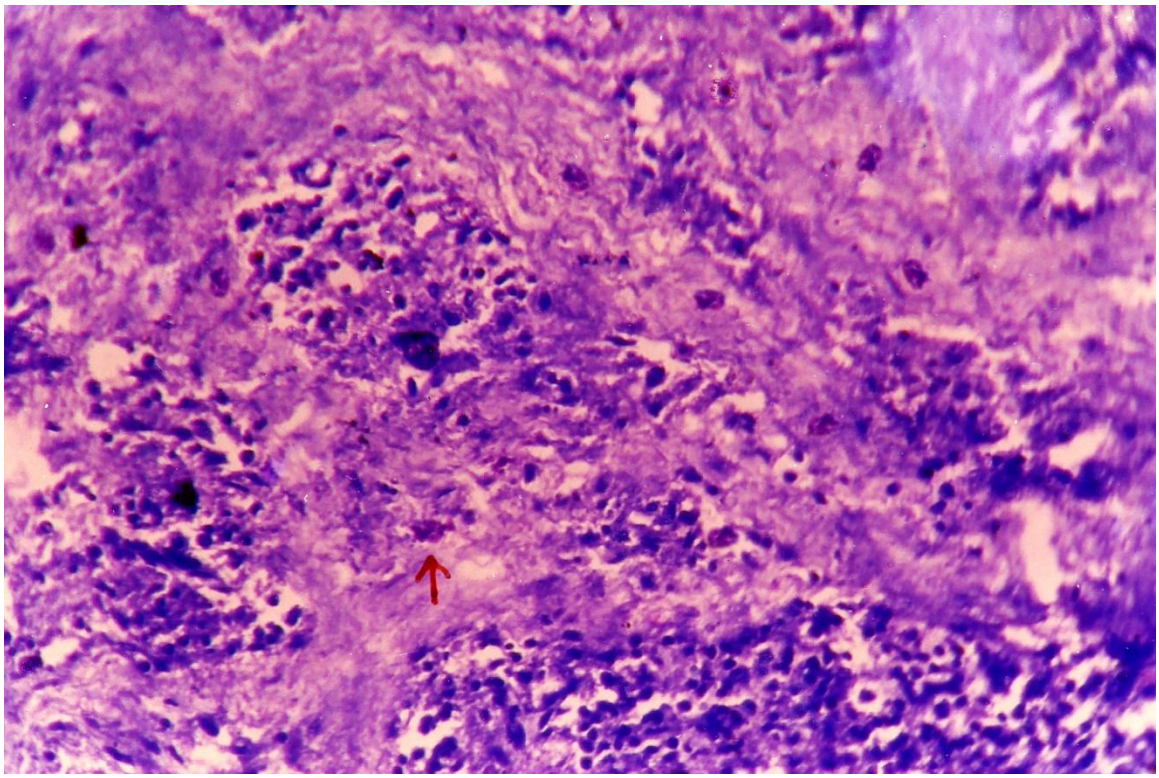

Figure 4: Rhinoscleroma showing mast cell infiltrate. Toluidine blue stain x400.

REFERENCES

1. Batsakis JG, EL-Naggar AK. Rhinoscleroma and rhinosporidiosis. Ann Otol Rhinol Laryngol 1992;101:879–882.
2. Shum TK, Whitaker CW, Meyer PR. Clinical update on rhinoscleroma. Laryngoscope 1982; 92 (101): 1149-1153.
3.Von Hebra F, Kohn M. Über ein eigenthümliches Neugebilde an der Nase. Wien. Med. Wochenscher 1870; 20: 1-5.
4.Nouri H, Raji A, Bouchoua F, Mbarek A. Rhinoscleroma. Fr ORL 2006; 91: 260-262.
5. Sedano HO, Carlos R, Koutlas IG. Respiratory scleroma: A clinicopathologic and ultrastructural study. Oral Surg Oral Med Oral Pathol Oral Radiol Endod.1996; 81: 665-671.
6.Wahi A. L. and Misra R. N. A Note on the Geographical Distribution of Scleroma. J Laryngol Otol 1964,73: 573.
7. Ehrich P. Beitrage Zur Kenntnis der Anilinfarbugen und ihrer Verwendung in der mikro sko pischen Technik. Arch Mikros Anat 1977; 13: 263.
8. Ratnakar KS, Goswamy V, Agarwal LP: Mast cell alteration in pterygium. Acta Ophth 1976;54:363.
9. Talvalkar GV. Some observations on rhinoscleroma. Jou PG Medicine 1969; XV: 69-76.
10. Malur PR, Nagalitimath SJ. Scleroma in Belgaum. Karnataka Medical Journal.1978;114-119.
11. Esteban R. Observations based on a study of 200 cases of Rhinoscleroma. Arch Derm Symphiliology 1946;54: 531-537.
12. Paul RM. Scleroma (Rhinoscleroma). Arch Pathol Lab Med.1983;107: 377-383.
13. Bailhache A , Dehesdin D, François A, Marie JP, Choussy O. Rhinoscleroma of the sinuses. Rhinolog. 2008; 46:338-341.
14. Avery RK, Salman SD, Baker AS. Rhinoscleroma treated with ciprofloxacin: a case report. Laryngoscope. 1995; 105: 854-856.
15. Riley JF. Functional significance of histamine and heparin in tissue. Mast cells. Ann N Y Acad Sci.1963;103:151-163.
16. Smyth CJ, Gum OB. Vasculitis, mast cells and collagen disease. Arthritis & Rheumatism, 1961;4:1-17.
17. Morrione JG. The formation of collagen fibers by the action of heparin on soluble collagen: An electron microscopic study. J Exp Med 1952;96:107.

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