ISSN No. 2321-2705 | DOI: 10.51244/IJRSI |Volume XI Issue XI November 2024

Ligneous Conjunctivitis – A Case Report

Dr. Musharrat Alam Tarin[1], Dr. Afrina Khanam[2*], Dr Tasmin Akter[3], Dr. Md. Nasimul Gani Chowdhury[4]

[1,3]Assistant Surgeon, Chittagong Eye Infirmary & Training Complex, Chattogram, Bangladesh

[2*] Resident, Institute of Community Ophthalmology, Chittagong Eye Infirmary & Training Complex campus, Chattogram, Bangladesh

[4]Chief Consultant, Chittagong Eye Infirmary & Training Complex, Chattogram, Bangladesh

[*]Corresponding Author

DOI: https://doi.org/10.51244/IJRSI.2024.11110021

Received: 26 October 2024; Accepted: 03 November 2024; Published: 30 November 2024

ABSTRACT

Purpose: To describe a case of ligneous conjunctivitis, an uncommon type of recurrent, chronic conjunctivitis that mostly affects the tarsal conjunctiva but can also affect other mucous membranes of the body. It is characterized by a firm, fibrin-rich, woody-like pseudo-membrane formation. **Case report:** We here describe a case of ligneous conjunctivitis in a three and half years old boy presented with bilateral conjunctival masses for more than two years associated with discomfort, discharge, thick upper eyelids without swelling. **Conclusion:** Ligneous conjunctivitis is a rare form of pseudo-membranous or membranous conjunctivitis, with formation of indurated plaques. Despite repeated abscissions, these lesions recur rapidly. Corneal involvement can turn into vision threatening condition.

Key word: Ligneous conjunctivitis, plasminogen deficiency, membranous conjunctivitis

INTRODUCTION

Ligneous conjunctivitis is a rare form of inflammatory lesion of conjunctiva characterized by recurrent, chronic conjunctivitis with fibrinous pseudo-membrane formation. The essential clinical feature is the appearance of irregular, elevated, thickened, wood-like membranes covering the tarsal conjunctiva [1]. Other mucous membranes, including mouth [2,3] (ligneous gingivitis or peridonitis), nasopharyngs, tracheobroncheal tree, [4] kidney, and female genital tract (ligneous vulvovaginitis or cervicitis) [5,6] sometimes become involved. Some patients additionally suffer from congenital occlusive hydrocephalous [7,8]. Furthermore, juvenile colloid milium (development of small, yellow-brown, translucent papules) may be present in sun exposed areas [9]. Young, female children are most commonly affected (female: male = 3:1). Suspicion for ligneous conjunctivitis must be raised if there is recurrence, despite peeling of the membrane, especially in children. Evaluation of ears, nasopharynx, oral cavity, trachea should be done for any pseudo-membrane on those surfaces. It is quite hard to treat the lesion.

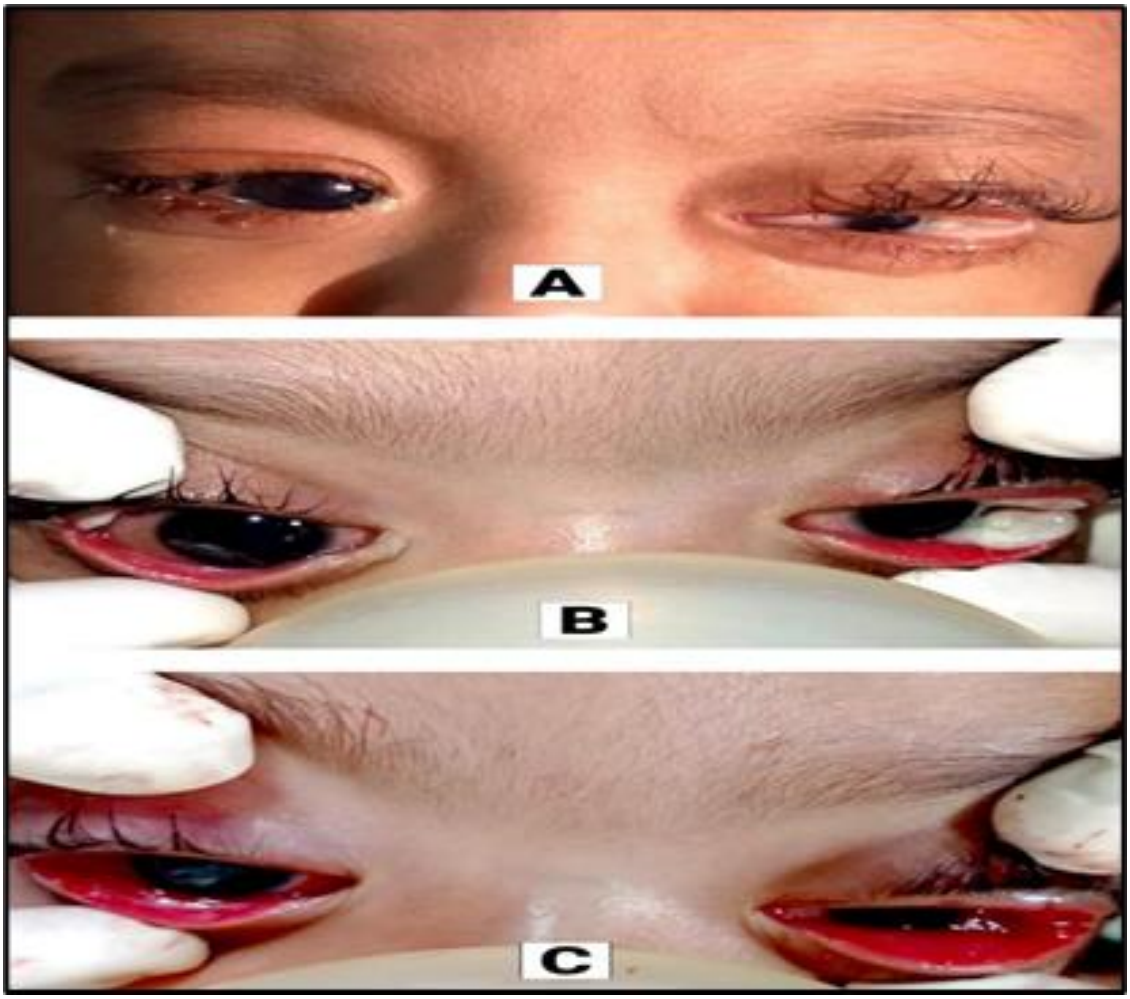
Case presentation

A three and half years old boy presented to the pediatric outpatient department of Chittagong Eye Infirmary and Training Complex for the first time in May 2021 at the age of 1 year with the complain of bilateral conjunctival masses (Fig:1) for several months and treatment with topical antibiotic eye drop was not helpful. The patient had no contributory history of ocular trauma, drug allergy or family history of tumour. There was nothing remarkable about his prenatal, natal, or postnatal history. On ocular examination, there were bilateral conjunctival masses with pseudo-membranes in upper eyelids, and pseud-membrane and deposits of yellowish-white lipid like substances on the bilateral lower palpabral conjunctiva. Extraocular motilities were full in all gazes in both eyes. He was born to normal parents with no history of consanguineous marriage. His

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI |Volume XI Issue XI November 2024

siblings did not have any relevant ocular and systemic anomalies. He was diagnosed clinically as a case of ligneous conjunctivitis. No other mucous membranes were involved. After surgical excesion, he was treated with combination of topical cyclosporin A (2%; 20mg/ml) and dexamethasone 2-6 hourly. But it failed to decrease the frequency of recurrences and severity of disease. Topical plasminogen concentrate(1mg/ml) prepared from fresh frozen plasma of his mother were applied for every 2 hours for 3-4 weeks and then reduced to four times a day for 1 month, but the result was not satisfactory. In july, 2023 a new approach was applied, consists of surgical excision of pseudo-membrane and immediate perioperative topical treatment with intensive (every 30-60 min) standard heparin (2000 units/ml). Heparin eye drops are not availabe in the market. We prepared it from Injection heparin sodium 25,000 unit/5ml vial used for cardiac patient. We took 4ml of heparin and mixed it with 6 ml of artificial tear. Thus, a total of 10 ml contains 20,000 units of heparin and each ml contains 2,000-unit heparin. This intensive treatment was continued until re-epithelialization of conjunctival surfaces was observed.

Then topical heparin slowly tapered until all signs of conjunctival inflammation subsided. Topical dexamethasone and cyclosporin were also applied. Excised membrane was sent for histopathology which shows (Fig:2) severe chronic inflammation of conjunctival mucosa with predominantly infiltration of neutrophil, lymphocyte, and plasma cells, fibrous tissue hyperplasia and inflammatory exudate in the lamina propria. The lesion recurs after one month. We repeat the procedure in same manner in September, but in last follow-up in October 2023 his pseudomembrane recurred, but in less extensive form.



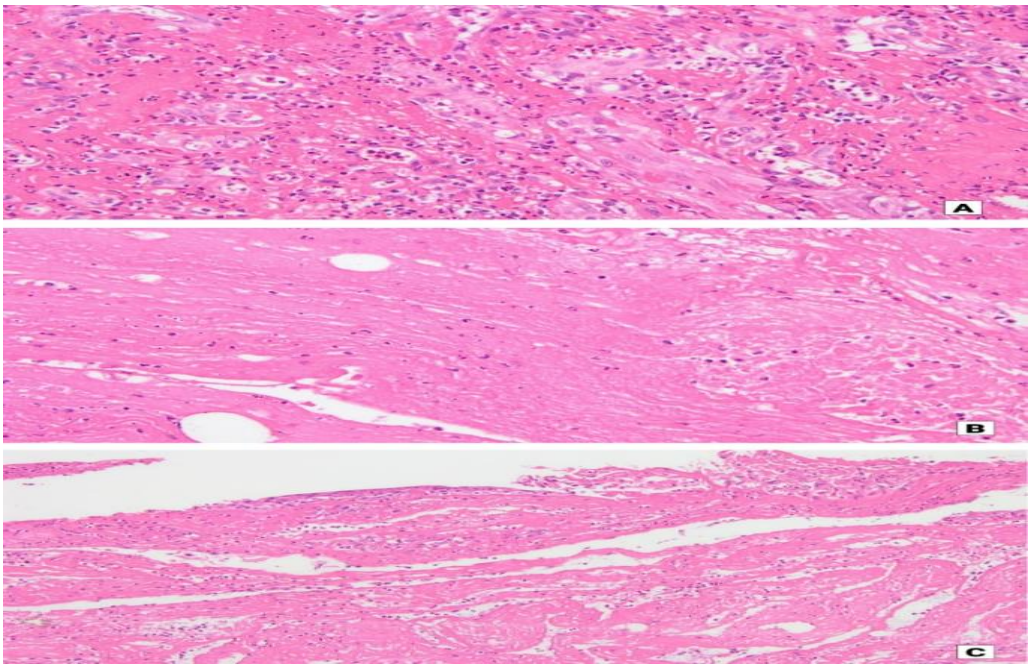
(A) In normal position.

(B) Just before membrane excision.

(C) Just after excision of membrane.

Figure-1: Bilateral, elevated hard mass arising from tarsal conjunctiva

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI |Volume XI Issue XI November 2024



(A) Neutrophil, lymphocyte and plasma cell infiltrate with predominance of eosinophil.

(B) Inflammatory cell component with amyloid-like material depositions.

(C) Thin conjunctival epithelium with fibrinous membrane.

Figure-2: Histopathology of conjunctival membrane

DISCUSSION

Ligneous conjunctivitis is rare disease of conjunctival epithelium secondary to plasminogen deficiency [10,11]. Ophthalmic involvement is most common having the striking feature of pseudo-membranous conjunctivitis with deposition of firm, woody, amyloid like material [12].

The first case of ligneous conjunctivitis was reported in 1847 by Bouisson [13]. Ligneous conjunctivitis was described by Von Graefe first in 1854, though this distinctive name was not introduced by him [14]. In 1924, detailed histologic description was reported by Lijo Pavia [15]. Previously it was named ‘conjunctivitis pseudomembranacea chronica granulomatosa’ [16]. The name ligneous conjunctivitis was introduced in 1934 by Borel [17].

Its prevalence and incidence are not known at present, nor any ethnic predisposition is observed. The mean age of onset is 3.5 to 5 years [18], though it can occur at any age [19].

Although most of the reported cases are sporadic, familial cases have also been observed in autosomal recessive pattern [20]. Confusingly literature showing girls predilection with female / male ratios ranging from 1.4:1 to 2:1 [21]. Here mutation occurs in the plasminogen (PLG) gene, located on chromosome 6q27, associated with type 1 plasminogen deficiency [22].

The pathophysiology of ligneous conjunctivitis is yet unknown. In chronic and overwhelming local inflammation there is increase deposition of fibrin (ogen) and other plasma proteins occurs, which degrades in fibrin degradation products mediated by plasmin, formed from plasminogen [23]. Several authors denotes that in ligneous conjunctivitis this plasmin mediated extracellular fibrinolysis is greatly impaired [24].

Histopathological findings of pseudo-membrane from affected eyes includes thinned or eroded conjunctival epithelium with hyperplasia and extension of the epithelial layer into the substantia propia forming cyst and glandlike structure. There are neovascularization and superficial or subepithelial deposit of amorphous, hyaline

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI |Volume XI Issue XI November 2024

like eosinophilic materials, which contain fibrillar material, consistent with fibrin. Multiple foci of granulation tissue with inflammatory cells infiltration, mainly lymphocytes, plasma cells and granulocytes, are also observed.

As surgical procedures itself acts as potent triggering factor for recurrence of ligneous conjunctivitis, the number of pseudo-membrane excision and others surgical procedures should be kept to a minimum and should be done under coverage of local topical treatment (topical heparin), if necessary.

The available local treatments for ligneous conjunctivitis are mostly disappointing. Numerous treatment paradigms, with combination of medical and surgical therapy, have been applied to decrease the recurrence. Scleral grafting, [25] topical hyaluronidase (1.5mg/ml) alone or in combination with alpha-chymotrypsin (0.2 mg/ml) for enzymatic digestion of mucopolysaccharides and matrix protein in pseudomembrane, [26] long term local treatment with a combination of corticosteroid and cyclosporin A(0.1% or 1 mg/ml), [27] systemic use of azathioprine,[18] topical plasminogen concentrate (approximately 1 mg/ml) prepared from fresh frozen plasma are several treatment options used for treating ligneous conjunctivitis [28]. DeCock et al have initiated a new approach consist of surgical excision of pseudomembranes and immediate, perioperative topical treatment with intensive (every 30-60 min) standard heparin (1000 or 5000 units/ml) in combination with topical corticosteroids (0.5% or 1% prednisolone or 0.1% dexamethasone) [18]. This intensive treatment was continued until re-epithelialization of the conjunctival surface was observed. Heparin accelerates the activity of antithrombin 3, which prevents thrombin synthesis and activity, hence preventing fibrinogen from becoming fibrin. Additionally, heparin neutralizes factor Xa to stop thrombin from forming from prothrombin. Therefore, this combination seems to be logical. Triple combination of topical corticosteroid, heparin and cyclosporin A (2%) was reported to be successful in some patients. We used topical fresh frozen plasma from his mother, but the result was disappointing. Heparin eye drops are not commercially available. We prepared it from heparin sulphate injection used for cardiac patients and we applied the triple combination method which delayed the recurrence.

CONCLUSION

A rare variation of chronic conjunctivitis is ligneous conjunctivitis. It tends to recur repeatedly, though it is described as pseudo-membrane in different books and articles, but practically it seems to be a true membrane, which is difficult to remove, and forceful removal causes diffuse haemorrhage. Triple combination of topical heparin, cyclosporin and corticosteroid are helpful in reducing its recurrence,

REFERENCES

1. Abreu GB, Versalovic CA, Abreu EB, et al: Conjuntivite lenhosa: apresentcao de um caso. ArqIPB 34:85–7, 1992
2. Baykara M, Moray P, Tavassoli S: Oral findings in a ligneous conjunctivitis case. HU Dis Hek Fak Dergisi 19:116–8, 1995
3. Diamond JP, Chandna A, Williams C, et al: Tranexamic acid-associated ligneous conjunctivitis with gingival and peritoneal lesions. Br J Ophthalmol 75:753–4, 1991
4. Babcock MF, Bedford RF, Berry FA: Ligneous tracheobronchitis: an unusual cause of airway obstruction. Anesthesiology 67:819–21, 1987
5. Buck DC, Ridley CM: Ligneous conjunctivitis involving the cervix. Case report. Br J Obstet Gynaecol 97:193, 1990
6. Goldman H, Hof W: Familiare pseudomembranose Conjunctivitis. Schweiz Med Wschr 84:73–5, 1954
7. Berlin AJ, Carim M, Langston RH, Price RL: Scleral grafting in the management of ligneous conjunctivitis. Ophthalmic Surg 13:288–91, 1982
8. Chai F, Coates H: Otolaryngological manifestations of ligneous conjunctivitis. Int J Pediatr Otorhinolaryngol 67:189–94, 2003
9. Hashimoto K, Nakayama H, Chimenti S, et al: Juvenile colloid milium. Immunohistochemical and ultrastructural studies. J Cutan Pathol 16:164–74, 1989
10. Schuster V, Seregard S. Ligneous conjuctivitis. Surv. Ophthalmol.2003; 48; 369–388.

ISSN No. 2321-2705 | DOI: 10.51244/IJRSI |Volume XI Issue XI November 2024

11. Schuster V, Zeitler P, Seregard S et al. Homozygous and compound-heterozygous type I plasminogen deficiency is a common cause of ligneous conjunctivitis. Thromb. Haemost.2011; 85; 1004–1010.
12. Raimann R, Moya R, Anguita R, Kobus R, Pérez M, Gonzalez P. Clinical, histopathological, and genetic aspects in one case of ligneous conjunctivitis. Ophthalmic Genet. 2018;39(5):642–4. https://doi.org/10.1080/13816810.2018.1502791
13. Bouisson M: Ophthalmie sur-aigue avec formation de pseudomembranes a la surface de la conjonctive. Ann Oculist 17:100–4, 1847
14. Kraft J, Lieb W, Zeitler P, Schuster V: Ligneous conjunctivitis in a girl with severe type I plasminogen deficiency. Graefes Arch Clin Exp Ophthalmol 238:797–800, 2000
15. Lijo Pavia J: Tumor inflammatorio fungoso recidivante de la conjunctiva palpebral. Semana Med 31:326–31, 1924
16. Saubermann G: Conjunctivitis pseudomembranacea chronica granulomatosa (lignosa). Ophthalmologica 118:666–86, 1949
17. Borel MG: Un nouveau syndrome oculo-palpebral. Ann Oculistique 171:207–22, 1934
18. Hidayat AA, Riddle PJ: Ligneous conjunctivitis. A clinicopathologic study of 17 cases. Ophthalmology 94:949–59,1987
19. De Cock R, Ficker LA, Dart JG, et al: Topical heparin in the treatment of ligneous conjunctivitis. Ophthalmology 102:1654–9, 1995
20. Francois J: Considerations on the importance of genetics in ophthalmology. Ophthalmologica 178:381–95, 1979
21. Pfannkuch F, Schmidt R, Schmidt B, Seiler T: [Morphologic studies of the pathogenesis of ligneous conjunctivitis]. Klin Monatsbl Augenheilkd 190:40–5, 1987
22. Petersen TE, Martzen MR, Ichinose A, Davie EW: Characterization of the gene for human plasminogen, a key proenzyme in the fibrinolytic system. J Biol Chem 265:6104–11,1990
23. Eagle RC Jr, Brooks JS, Katowitz JA, et al: Fibrin as a major constituent of ligneous conjunctivitis. Am J Ophthalmol 101:493–4, 1986
24. Arumugam S, Jang YC, Chen-Jensen C, et al: Temporal activity of plasminogen activators and matrix metalloproteinases during cutaneous wound repair. Surgery 125:587–93, 1999
25. Rao SK, Biswas J, Rajagopal R, et al: Ligneous conjunctivitis: a clinicopathologic study of 3 cases. Int Ophthalmol 22:201–6, 1998
26. Chambers JD, Blodi FC, Golden B, McKee AP: Ligneous conjunctivitis. Trans Am Acad Ophthalmol Otolaryngol 73:996–1004, 1969
27. Holland EJ, Chan CC, Kuwabara T, et al: Immunohistologic findings and results of treatment with cyclosporine in ligneous conjunctivitis. Am J Ophthalmol 107:160–6, 1989
28. Watts P, Suresh P, Mezer E, et al: Effective treatment of ligneous conjunctivitis with topical plasminogen. Am J Ophthalmol 133:451–5, 2002