ENDOSCOPIC MANAGEMENT OF FRONTO-ETHMOIDAL SINUS MUCOCOELE

Aims & Objective: The aim of this study was to present the efficacy of endoscopic sinus surgery for management of fronto-ethmoidal sinus mucocoele.

Material and Methods: A prospective, longitudinal, observational study of seven patients with clinical and radiological evidence of mucocoele of fronto-ethmoidal area from June 2008 to June 2009 and who underwent endoscopic wide marsupialization of mucocoele cavity with or without fronto-ethmoidectomy were included in the study.

Results: Duration of symptoms ranged from 25 days to 1 year. Most common symptoms were swelling in supero-nasal, medial canthal region, infero-lateral eye displacement. Majority of patients had soft to hard swelling in periorbital region and non axial proptosis. One patient had lid ptosis and two patients still complained of diplopia after surgery. Postoperative endoscopy revealed widely opened sinus cavity with epithelialisation of mucosa without sign of recurrence in all the cases.

Conclusion: Endoscopic marsupialisation with drainage through nasosinusal approach proved to be safe and efficient procedure in therapeutic approach of frontoethmoidal mucocoele.

Key words: Mucocoele, Endoscopic, Marsupialization, Frontoethmoidal

Introduction: Mucocoele first described by Langenbeck in 1818, is an epithelial lined, mucous containing sac completely filling the sinus and capable of expansion. A clinically significant mucocoele most commonly originates in the frontoethmoidal sinus. Frontoethmoidal areas are most susceptible to mucocoele formation due to complexity of its drainage as compared to sphenoid and maxillary sinuses. Mucocoele are usually unilateral but in five percent cases they are bilateral and/or multiloculated. In at least a third of cases they occur without an obvious predisposing factor but in remaining cases predisposing factors are infection, polyps, trauma and allergic rhinitis. There are conflicts among author concerning the etiology of mucocoele. Some suggest they develop from obstruction of sinus ostium whereas other believe that mucocoele formation occurs when there is obstruction of duct of minor salivary glands located within the lining of paranasal sinus. Either mechanism they result as a consequence of obstruction plus inflammation.

The diagnosis of mucocoele is based on the history, physical examination and radiological findings. Fronto-ethmoidal mucocoele usually present with orbital symptoms of infero-lateral eye displacement, lid edema, swelling in supero-nasal and medial canthal region, diplopia, proptosis, ptosis, palpable mass, reduced vision, orbital pain and headache. Computed tomography (CT) scan and magnetic resonance imaging (MRI) are effective in detecting the lesion and in demonstrating any intracranial extension. Several treatment options are available and choice depends on the degree of extension and may range from functional endoscopic sinus surgery to external approach, craniotomy and craniofacial exposure with or without obliteration of the sinus. The current tendency is to conduct functional, minimal invasive and low morbidity procedure with nasosinusal endoscopic surgery with marsupialization and abundant drainage of the lesion, preserving the epithelium. The aim of this study was to present the efficacy of endoscopic sinus surgery for management of fronto-ethmoidal sinus mucocoele.

Material and Methods: A prospective, longitudinal, observational study was conducted at Department of ENT- Head and Neck surgery of Ganesh Man Singh Memorial Academy of ENT- Head and Neck Studies, Tribhuvan University Teaching Hospital, Kathmandu, Nepal from June 2008 to June 2009. We included patient with clinical and radiological evidence of mucocoele of fronto-ethmoidal area. Patient with involvement of paranasal sinus other than fronto-ethmoidal region, coexisting other pathology like polyp and with history of previous surgery for mucocoele were excluded from study. All patient underwent endoscopic wide marsupialization of mucocoele cavity with or without fronto-ethmoidectomy by single surgeon. No stent were kept in all the cases. The aspirated fluid was send for culture and lining mucosa for histopathological examination. Postoperatively all patients were given oral cefixime according to body weight and were advised to douche the nasal cavity with normal saline twice daily both for two weeks. Patients were evaluated at 2 weeks, 2 months and 6 months following surgery. Study variable noted were age, sex, sinus/side involved, duration of symptoms, past history, physical finding, proptosis, intracranial extension, postoperative complication and follow-up endoscopic finding.

Results: Total of seven patients were included in the study. There were five male and two female. Age of patient ranged from 24 years to 70 years. Out of seven patients with mucocoele, four were frontoethmoidal, two were ethmoidal and one was frontal sinus mucocoele. In five patients right side and in two patients left side sinus were involved. Duration of symptoms ranged from 25 days to 1 year (Table 1). Most common symptoms swelling in supero-nasal, medial canthal region, infero-lateral eye displacement, increased lacrimation, headache, blurring of vision in decreasing frequency respectively. No nasal symptoms were noted in any of the patients. Majority of patients had soft to hard swelling in periorbital region. Similarly five patients had non axial proptosis and two had no orbital displacement. CT scan showed radiological finding compatible with mucocoele in all cases. Culture of aspirated fluid showed no microorganism or fungi. Histopathological examination was suggestive of mucocoele in all patients. Mean follow-up time was 4.5 months. Table 2 shows that one patient had history of trauma two years prior to symptoms. One patient still had lid ptosis four month post surgery. Two patients still complained of diplopia six month after surgery. Postoperative endoscopy revealed widely opened sinus cavity with epithelialisation of mucosa without sign of recurrence in all the cases. (Table 2)

Discussion: A mucocoele is an epithelial lined mucous containing sac completely filling the sinus and is capable of expansion. They tend to expand, remodel and reabsorb bone wall of affected paranasal sinus, changing their integrity and occasionally affecting the neighbouring structure.
such as the orbit and intracranial cavity. Mucocele expands in the direction of least resistance, frontal and ethmoidal mucocele tends to erode the thin bone of superior and medial orbital wall extending into orbit displacing the globe infero-laterally. Vicente et al., found that disease has equivalent incidence in men and women but in our study we had more male patients which may be due to small sample size. In our study we found age of patients ranged from 24-70 years with mean age being 41.71 years. Vicente et al., found mucocele normally affects people on their 3rd and 4th decade but James et al., found highest incidences in 4th to 7th decade of life. Patients with mucocele in frontoethmoidal region present with orbital symptoms similar to our study. Considerable time lag between the initiating factor and the clinical presentation of mucocele occur, in the case of surgery or trauma this is an average of 23 years. In one of our case it occurred 2 years after trauma.

Treatment of mucocele is surgical. There are two modes of operative treatment; external and endonasal. External approach is made through Lynch-Howarth external fronto-ethmoidectomy with or without placement of stent or by osteoplastic flap with or without frontal sinus obliteration and total excision of mucosa. These procedures have significant surgical morbidities including scarring, cosmetic deformities and paresthesia. Furthermore, obliteration procedure may make follow up difficult because of the inability to visualize the cavity endoscopically and difficultly in imaging recurrent disease. Second approach is endonasal approach with marsupialization and abundant drainage by creation of new drainage pathway and preserving the epithelium. Intranasal marsupialization of mucocele was reported as early as 1921 by Howarth, who stated that by removing the floor of mucocele, one practically makes the mucocele a part of roof of nose. Endoscopic marsupialization of frontal sinus mucocele was first reported by Kennedy et al. in 1989. In our study also we found no sign of recurrence of mucocele during our follow up period. Kennedy et al. in a series of 18 mucocele found endoscopic surgical technique successful with no recurrence. Similarly Har-El G et al. in their study of 103 with 108 parasinal sinus mucocele treated with wide endoscopic marsupialization found a very low recurrence rate of 0.9% after mean follow up of 4.6 years. Khong et al. in their study of 41 patients with mucocele found that long term results of modified endoscopic Lothrop procedure and endoscopic marsupialization were similar. In a series of 48 patients found the recurrence rate to be 0% in the endoscopic group and 11% in the combined endoscopic and external group during mean follow up of 39 months. Kennedy et al. in a series of 15 case treated by endoscopic fontoethmoidectomy found 0% recurrence during follow up period of 3-42 months. Complications of endoscopic surgery for mucocele are minimal. Though there is potential risk of haemorrhage, CSF leak, and/or orbital damage but in practice this has not been reported. In our study we found one case of lid edema and two cases of persistence of dioplopia postoperatively. As these were persistence of symptoms they were not taken as complication of surgery. The advantage of endoscopic procedure is the preservation of bony framework of sinus involved, decrease operative time, no external incisions, decrease hospitalization and thus the surgical cost. With this approach the mucosal lining and function of the sinus are preserved and following surgery direct endoscopic visualization of the area enables accurate follow up. Patients with mucocele require long term follow up since recurrence of mucocele may occur even years after surgery.

CONCLUSION:

Functional endoscopic surgery affords the potential for dramatically reducing operative morbidity of surgery for parasinal sinus mucocele by offering a minimal invasive approach and also direct endoscopic visualization of the area enables accurate follow up. There is increasing evidence in the literature that endoscopic management of sinus
mucocoe is successful, with low morbidity rates and recurrence. Endoscopic marsupialization with drainage through nasosinusal approach proved to be safe and efficient procedure in therapeutic approach of frontoethmoidal mucocoe. Otorhinolaryngologist should consider the endoscopic approach as the surgical procedure of choice for management of frontoethmoid mucocoe.

REFERENCES: