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Ipsilateral Facial Oedema and Periorbital Ecchymosis Following Ear Surgeries

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ABSTRACT

Chronic Suppurative Otitis Media (CSOM) is a common community health disorder globally and surgery is generally employed for its permanent cure. Alongside the usual postoperative complications, two very rare periorbital complications like facial oedema and periorbital ecchymosis were observed in our institute that caused morbidity, prolonged hospital stay and psychological impact on the patient, his family and the treating doctors. To estimate the incidence of ipsilateral facial oedema and periorbital ecchymosis following ear surgeries in our hospital. Also, to identify their probable etiopathogenesis and management. Analytical study done during the months of August and September 2018 by evaluating record based data (June-2016 to September-2018) to find relation between study variables under consideration. Clinical settings of Ear, Nose and Throat (ENT) department of our tertiary care hospital. 192 patients aged between 10-60 years undergoing ear surgery through post auricular approach and have consented to participate in the study. Demographic details of the study population., details regarding the surgery like type of surgery done, type of anaesthesia used, operation time and patient's position during surgery., details regarding the complications encountered like incidence, type of periorbital complication, their first presentation, duration and intensity and treatment done were collected. Relation between these complications and various study variables is also determined. Study population was made of 192 patients (68 males and 124 females) and its mean age is 30.36±10.6 years. Incidence of these complications is 4.6875%, which had a significant relation with study variables like age and length of the surgery. No relation was observed with any of the other variables like sex, type of anaesthesia used and type of surgery done. Substances with anti-inflammatory and proteolytic activities like Trypsin and Serratiopeptidase can be used safely to treat these complications. These are very rare, self limiting and benign complications and do not require any active intervention. Sound knowledge of operating area, gentle handling of tissues, effective usage of surgical aids and techniques are suggested to prevent their occurrence. Their etiopathogenesis must be clearly understood to develop better preventive strategies which needs further attention.

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Key Words
Ipsilateral facial oedema, periorbital ecchymosis, ear surgeries

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INTRODUCTION

Chronic suppurative otitis media (CSOM) is a quite common condition attacking 65-330 million humans across the globe and 28,000 among them are being killed. Though its incidence greatly decreased due to usage of advanced antibiotics, it is still a burning problem in many developing nations. Most of the cases are reported from developing countries in Southeast Asia, Western pacific region, Africa and minorities in Pacific rim[1]. Most of the CSOM cases following aural toilet and appropriate medical treatment need surgery for permanent cure and these surgeries include different types of tympanoplasties and mastoidectomies[1,2]. Though these surgeries are relatively safe, they are known to have few postoperative complications like graft failures, infections, hematomas, taste disturbances, conductive and sensori-neural hearing loss, vertigo, facial paralysis[3,4]. The actual incidence of these complications is <1% when compared to that of disease related complications, if no treatment was given[5-7]. Apart from these well documented complications, few issues of concern like periorbital complications following ear surgeries are seldom described. Some reported similar issues like periorbital oedema, preseptal cellulitis and other ocular complications following cochlear implantation and surgeries employed for the treatment of CSOM[8-11]. However, these complications are common following rhinoplasty and maxillofacial surgeries[12]. Multiple osteotomies during rhinoplasty and repair of fractures of facial skeleton in maxillofacial surgeries can cause periorbital oedema and ecchymosis[13]. This is because the operative site is nearby and dissection can lead to oedema and ecchymosis postoperatively. As these are anticipated complications following these procedures, treating doctor will counsel the patient beforehand, so that they will not cause much apprehension among the both. These complications prolong the recovery time and may affect patient's social life[8,14,15]. If these periorbital complications occur following a surgical procedure which is away from these sites, then they definitely cause a psychological impact not only on the patient and his family but also among the treating doctors. In our institute we observed the occurrence of two such very rare periorbital complications like ipsilateral facial oedema and periorbital ecchymosis following ear surgeries done through post auricular route.

MATERIALS AND METHODS

This is an analytical study done in the clinical settings of ENT department of our hospital during the months of August and September 2018 using retrospective data from June 2016 to June 2018 which was collected from the hospital records and the cases done during the study period were added subsequently. Study population included 192 patients (Males: 68 and Females: 124) who were aged between 10-60 years and underwent surgery through post auricular approach in our hospital. All the data regarding the patients and surgery like age, sex, surgery done, operation time, method of anaesthesia used and position of patient during the surgery was collected from the medical records department and OT register. Patients with periorbital complications were identified and their appropriate clinical features like type of periorbital complication, their first presentation, duration and intensity, treatment done were noted. We checked for other local and systemic complaints also. All the required data of new cases who underwent surgery during the study period was collected from their clinical examination. We included all the patients for whom same surgical techniques were followed and removal of bandage was done on second postoperative day (POD). Confidentiality is assured regarding all the patient particulars at all stages of the study. We made a tailored classification (Table-1) to assess these complications into three grades based on their maximum intensity observed in the patient after surgery. Results obtained were entered into Microsoft Excel and further statistical analysis was done using SPSS software version 16.0. Association between the study variables was assessed using a chi-square test. Factors are considered to have significant relation when the p value is less than 0.05. All the necessary permissions needed for a record based study and institutional ethical clearance were taken before proceeding with the study.

RESULTS AND DISCUSSIONS

Demographic Details: A total of 192 patients (68 males and 124 females) participated in this study. Mean age of the study population is 30.36±10.6 years. All the patients were aged between 10-60 years, a majority of 63% were aged between 20-40 years and a minority were between 50-60 years of age.

Surgical and Complication Details: Majority of the patients i.e., 161 cases (60 males and 101 females) underwent only tympanoplasty and remaining 16% of them i.e., 31 cases (8 males and 23 females) underwent both tympanoplasty and mastoidectomy. Majority of the patients i.e., 124 cases (65%) were operated under local anaesthesia (LA) and remaining 68 cases (35%) were operated under general anaesthesia (GA). Majority of the patients i.e., 122 cases (63%) were operated within a duration of 120 minutes, whereas 37% had surgery for longer duration i.e., more than 120 minutes. Majority of the patients i.e., 183 cases (95%) did not experience these periorbital complications but a minority of 5% experienced. Of the patients with these complications, 78% (7 cases) had only ipsilateral facial oedema and

Table 1: Classification of the Intensity of these Periorbital Complications

Periorbital Complication	GRADE 1	GRADE 2	GRADE 3
Facial Oedema[a]	Palpebral fissure is not closed	Palpebral fissure is partly closed	Palpebral fissure is almost totally closed
Periorbital Ecchymosis[b]	<1/3rd of palpebral involvement	1/3rd to 2/3rd of palpebral involvement	>2/3rd of palpebral involvement

[a]Facial oedema is classified based on the degree of closure of palpebral fissure.
[b]Periorbital ecchymosis is classified based on the degree of palpebral involvement

Table 2: Relation Between the Periorbital Complications and Various Study Variables

Variable	Status after the surgery				
	Complications	No complications	Chi square value	P value	Inference
Age (n=192)					
<30 Years	1	95	5.7122	0.01	Sig.,
>30 Years	8	88			
Sex (n=192)					
Male	1	64	0.3365	0.56188	NS
Female	8	119			
Length of surgery (n=192)					
<120 minutes	1	121	11.2049	0.0008	HS
>120 minutes	8	62			
Type of surgery (n=192)					
Tympamoplasty	6	155	2.0603	0.15117	NS
Tympanoplasty and mastoidectomy	3	28			
Type of anaesthesia (n=192)					
GA	3	73	0.154	0.6945	NS
LA	6	110			

Abbreviations: Sig-significant, HS-Highly significant, NS-Non significant, df=1

Table 3: Demographic and Clinical Details of the Nine Cases with Periorbital Complications

Case	Age	Sex	Disease	Surgery Done	POD	Facial oedema	Periorbital ecchymosis	Anaesthesia	Operation time (min)
1	39	F	Rt. CSOM	MRM	2	Grade 1	Grade 3	GA	275
2	33	M	B/L. CSOM	T.plasty	2	Grade 2	Absent	LA	150
3	42	F	Lt. CSOM	MRM	3	Grade 1	Absent	GA	260
4	31	M	Rt. CSOM	MRM	2	Grade 1	Grade 1	GA	240
5	42	F	B/L. CSOM	T.plasty	2	Grade 1	Absent	LA	155
6	32	M	Rt. CSOM	T.plasty	2	Grade 1	Absent	LA	250
7	50	F	Rt. CSOM	T.plasty	2	Grade 2	Absent	LA	130
8	38	F	Lt. CSOM	T.plasty	2	Grade 1	Absent	LA	110
9	22	M	Lt. CSOM	T.plasty	2	Grade 1	Absent	LA	180

Abbreviations: M-Male, F-Female, Rt-Right, Lt-Left, B/L-Bilateral, T.plasty-Tympanoplasty, MRM-Modified Radicle Mastoidectomy, GA-General Anaesthesia, LA-Local Anaesthesia.

22% (2 cases) had both facial oedema and periorbital ecchymosis. When the relation between these complications and various study variables are observed, association between age and length of the surgery were found to be significant (Table-2).

Demographic Details:

- Mean age of the study population is 30.36±10.6 years. Study population comprised of 35% males and 65% females.

Surgical Details:

- For this study we employed various types of tympanoplasties and mastoidectomies to treat CSOM, 161 (84%) underwent only tympanoplasty and 31 (16%) underwent tympanoplasty with mastoidectomy.
- During surgery, position of the patient is supine with head turned laterally so that operating ear faces upwards during surgery and surgical approach for all the patients was post-auricular route.
- Operation time ranged from 90 minutes to 275 minutes depending on the type of surgery, pathology and expertise of the operating surgeon. Average duration of the surgeries is approximately 180 minutes. But, maximum number of cases were operated within a duration of 120 minutes.

Complications and their Etiopathogenesis: Incidence of these periorbital complications in our study is 4.6875%. Among the 9 cases with these complications, 7 (78%) had only facial oedema whereas 2 (22%) had simultaneous periorbital ecchymosis also. Demographic and clinical details of these nine cases are shown in (Table 3). We did not observe preseptal cellulitis, subconjuctival hemorrhage and blurring of vision as observed in other similar studies[8-11]. The incidence of these complications had a significant relation with study variables like age and length of the surgery and no relation was observed with any of the other variables like sex, type of anaesthesia used and type of surgery done (Table-2). Complications occurred more frequently in patients aged >30 years and when the duration of surgery is more than 120 minutes. In older patients, the frequency and intensity of these complications is more because of lax tissues as a result of ageing process[16]. Patients undergoing lengthier surgical procedures are more prone for these complications[8,16]. The intensity of these complications may also increase with the operation time. Operation time in 2 cases with both oedema and ecchymosis is

>the cases with only oedema. This longer operation time might be because our study setting is a training institute and the cases are being handled by surgical trainee[17]. Mastoid drilling during mastoidectomy increases the risk of injury to surrounding structures[9,10]. So the risk of these complications is more following mastoidectomy. However relation between the type of surgery done and these complications was not significant in our study. In our study, both the cases with ecchymosis were operated under general anaesthesia only, the reason being unknown. We did not notice these complications in either operating or recovery room. They presented on 2nd POD in 8 patients and on 3rd POD in 1 patient with Grade-1 oedema. Their intensity increased to the maximum within 2-3 days and then decreased. The events completely subsided in all the patients by 10th-12th POD. None of our patients complained other local and systemic complications. Varied etiologies like trauma, infections and inflammations may cause oedema in periorbital region[10]. Superficial Muscular Aponeurotic System (SMAS) in face, galea in forehead and temporoparietal fascia in temple are continuous to each other. These layers enclose potential spaces that are also continuous to each other and cause seepage of fluid[10]. Loose subcutaneous areolar tissue of eyelids and sensitive soft tissue anatomy of temple favour easy fluid accumulation in these regions[18,19]. Post auricular region is supplied by branches of superficial temporal vessels and branches from posterior auricular vessels. Injury to branches of superficial temporal vein during surgery impairs venous drainage of periorbital and temporal region causing oedema. This occurs when the surgical approach is postaural or endaural[10]. Excess soft tissue manipulation during the surgery for better exposure of the surgical site may injure surrounding veins and lymphatics. This may cause accumulation of increased interstitial fluid and blood in soft tissues due to impaired drainage[20]. Anatomical variations in any of these vasculature may be responsible for rarity of these periorbital complications[10]. The caliber of the branches of these vessels do contribute to these complications. We did not encounter oedema when a normal caliber vessel is injured or cauterized but we did observe when the caliber of the vessel is relatively more. However, we did not measure diameter of these vessels. But, by its appearance we can tell grossly that the caliber of particular vessel is larger. Inadvertent and excessive use of monopolar cautery for dissection and coagulation may also contribute. Previously we used monopolar cautery for major part of the surgery in our hospital which may be one of the etiological factor. In view of these complications we started using bipolar cautery and incidence of these complications was reduced. Tight bandage and dressing following surgery may result in facial oedema due to continuous pressure around the skull. This is usually bilateral and unilateral facial oedema is most unlikely[9,10]. But, we did not observe any bilateral complications in our study. Any local injection of anaesthesia or adrenaline or steroid may also cause these complications. This is because of injury to deeper vasculature and lymphatics by the needle or spread of injected fluid to the periorbital region[21].

Management: As these complications are usually reported following rhinoplasty and maxillofacial surgeries, many techniques were employed in literature to decrease their duration or severity or both. Steroids, intra-operative hypotension, intra-operative cooling and post-operative head elevation reduce the intensity of these complications whereas periosteal elevation before osteotomy and post-operative nasal packing aggravated them. Though commonly employed, herbal supplementation namely Arnica montana, Carica papaya, Bromelain, a-chymotrypsin and melilotus extract showed mixed results and needs further studies[22]. Lidocaine-Adrenaline combination may exaggerate the oedema and ecchymosis when vasoconstrictive effect of adrenaline is lost[23]. But in our cases, we followed conservative treatment option like usage of Trypsin, Serratiopeptidase which has got anti-inflammatory and proteolytic enzyme activities. Oedema decreased in 8 to 9 days following its appearance.

CONCLUSIONS

Ipsilateral facial oedema and Periorbital ecchymosis are self-limiting and benign postoperative complications that do not need any active intervention. These complications are insidious in onset, progress to their full extent and slowly subside to normal. Though these are very rare and simple complications which can be readily dealt by medical and conservative management, they are definitely causing a psychological impact on the patient, his family and the treating health personnel when they do occur. The recovery time has also been increased causing prolonged stay in the hospital. As these complications are very rare following ear surgeries, doctor must counsel the patient and his family about these complications beforehand so that they do not panic later. Anatomical variations are not so uncommon in human body. We observed periorbital complications when same vessels with different calibres were addressed to haemostasis. Best way to avoid an injury during a surgery is to understand the surgical anatomy clearly. Also look for any deviations from normal anatomy in the patient. Effective and appropriate usage of instrumentation and gentle handling of tissues are always rewarding. Better pre surgical, surgical and post surgical techniques must be developed. Newer preventive strategies can be

introduced to lessen the duration and severity of these complications like decreased usage of monopolar cautery and encouraging the use of bipolar cautery as if required. Further studies must be conducted to understand the exact etiopathogenesis of these complications so as to develop better preventive strategies. Iatrogenic complications can and do occur in ear surgeries. Knowledge of what to do when the unexpected happens is the key to minimize any negative outcome for the patient. Whether the surgery is undertaken to treat CSOM or for other purposes, the key to avoid these iatrogenic injuries and untoward events is attention to detain.

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