

Prospective evaluation of contracted sockets

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Abstract

Aims: To establish a correct method of evaluation and management of contracted sockets

Results: Anophthalmic socket were frequently seen in orbit and Oculoplasty clinic of Aravind Eye Hospital, Madurai, South India. Prospective evaluation of Anophthalmic Sockets was done in this study. Anophthalmic Socket which can not support prosthetic eye is called contracted socket.^{4,5,14}. These sockets were graded as congenital and acquired, which were managed using single, combined and multiple procedures. Surgical outcome of each case were analyzed.

Key words: Anophthalmos, contracted sockets, prosthesis, conformer, volume deficit,

Clinically absence of eyeball is known as Anophthalmos, anatomically it is a state of complete absence of ectodermal and mesodermal tissues¹³. Anophthalmic sockets which cannot support prosthesis is called contracted socket^{4,5,14}.

Materials and methods

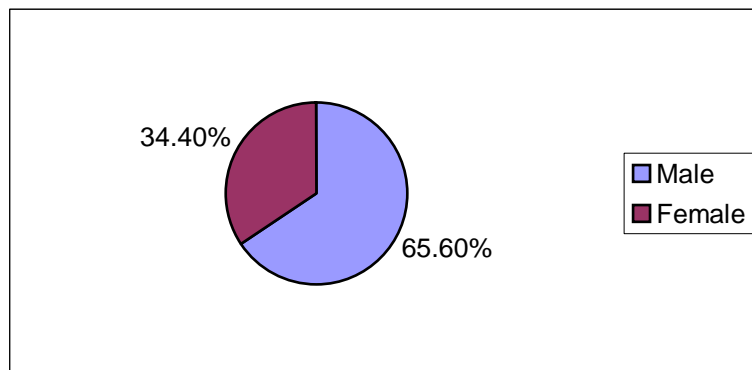
It is a non-randomized prospective study about the management of contracted sockets between September 2004 to August 2005. The age ranges from 2 days old neonates to 78 years male. Causes of contracted sockets are congenital and acquired. Among the acquired causes were symblepharon, volume deficient, lower fornix obliteration, ectropion, not using conformer for longer period, pseudoptosis and tight and loose canthal tendon faulty technique of enucleation, radiation, infection,

migration of implants, and multiple operations. Causes among congenital sockets were microphthalmos, cryptophthalmos, ankyloblepharon, lid coloboma, fornix obliteration, ectropion etc. Different surgical approaches like correction of lid position, fornix deepening, dermis fatgraft, symblepharon release, mucosa grafting, granuloma excision, canthoplasty were chosen according to type of contracted socket and conformer were fitted. Patients were asked for follow up after 6 months for prosthesis fitting and surgical outcome analyzed. Among 19908 patients, there were 8.2% Anophthalmos. Among 1739 Anophthalmos there were 7.7% contracted sockets. Among contracted socket there were 5.9% acquired and 1.8% of congenital origin.

Results

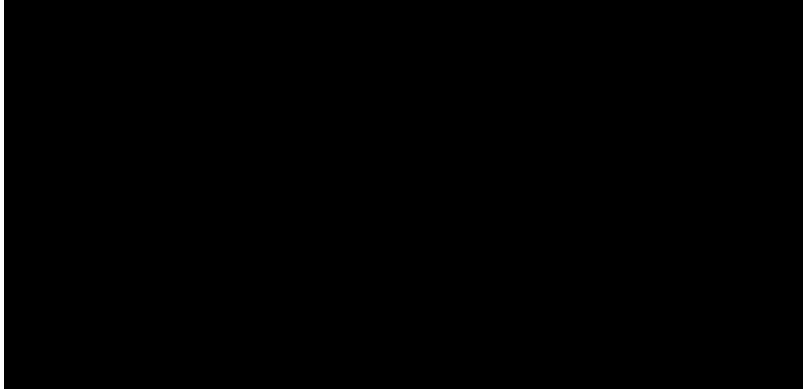
Demographic Pattern:

Sex: Nearly 2 times more in male than female indicating male are vulnerable to trauma.



Laterality:

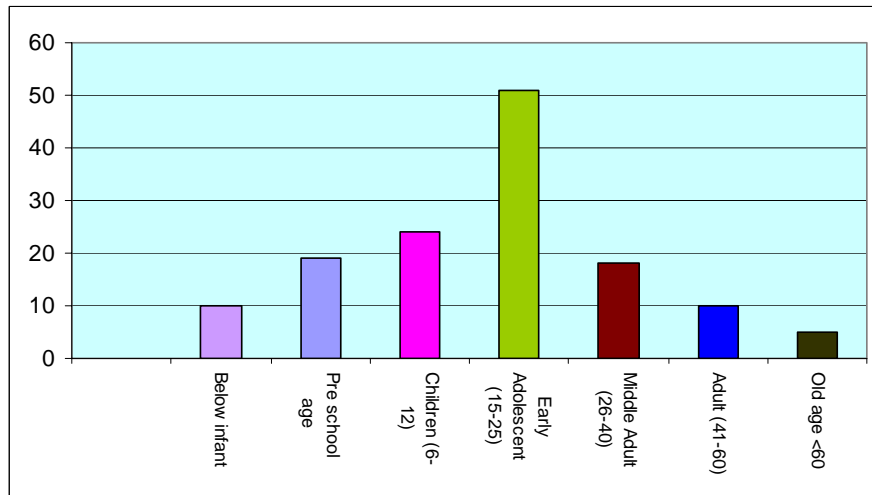
Frequency was more in RE 1.3 times more than LE. Bilateral cases were very few and were of congenital origin.



Age Distribution:

The age ranges from 2 days neonates to 78 years old. Majority of contracted sockets were found at early adolescent which is an active period of life and is vulnerable to trauma.

Age Distribution



Causes of contraction:

Majority of cases were due to faulty technique of enucleation, infection, ill fitting and not using prosthesis, second major cases were of congenital origin.

Causes of Contraction

| S.N. | Causes of contraction | Number | Percentage |
|-------|--|--------|------------|
| 1 | Faulty technique of enucleation/infection ill fitting not using prosthesis | 79 | 58.6 |
| 2 | Chemical injury (lime and vitreolase) | 11 | 8 |
| 3 | Radiation injury (Radiotherapy) | 7 | 5.1 |
| 4 | Thermal injury | 4 | 2.1 |
| 5 | Drug reaction (Stevenson Johnson Syndrome) | 3 | 2 |
| 6 | Congenital Condition | 33 | 24 |
| Total | | 137 | 100 |



Irradiated



Not properly enucleated



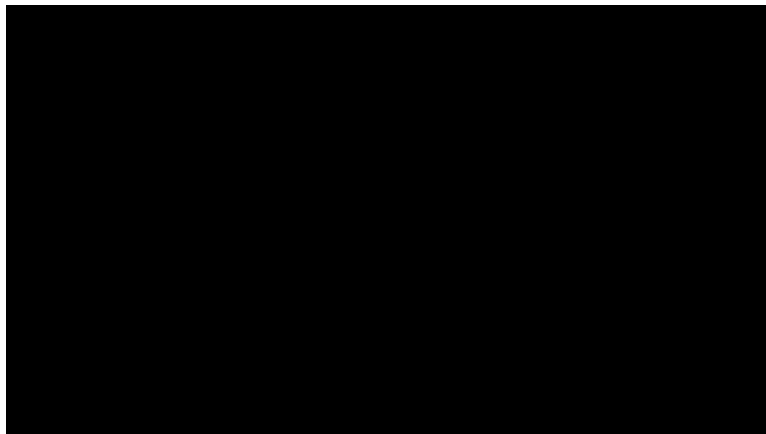
Congenital



Ill-fitted and infected

Clinical stages of contraction:

Majority of sockets were of Grade IV contraction (severe shrinkage and absence of conjunctiva, loss of fornices and round both canthi)



Discussion

After a long standing battle when patient party and health personnel were defeated to preserve vision of the patient, then they come to a solution of making anophthalmic socket. Anophthalmos were two times more in male than female indicating males are vulnerable to traumatic due to outdoor activities. Similarly, frequency was 1.3 times more in Rt eye than left eye.

After enucleation of eyeball prosthesis was covered by donor sclera and implanted. Muscles were sutured to the sclera at equal distance, than tenon capsule and conjunctiva were sutured separately. A conformer was placed over the conjunctiva to avoid symplepharon and shrinkage.

Enucleation and evisceration alters the anatomy, physiology, haemodynamics. Cosmesis and function of the orbit^{9,14}. Out of the 1739 sockets there were 7.7 (137) contracted sockets in our series.

Infection, Cicatricial conjunctival diseases, post enucleation radiation, absence or poor fitting conformer, absence or migration of implant faulty technique of enucleation and evisceration rotation of inferior tarsus, sagging of lower lid⁴ cicatricial ectropion^{1,2,4,7} pre enucleation trauma (chemical, thermal burns) congenital condition all contribute to form contracted sockets^{7,8}.

There were 5.9% (104) acquired and 1.8% (33) congenital cases, majority of acquired 58.8% cases were due to infection, faulty technique of enucleation and sagging lower lid or ill fitting prosthesis. Second largest group (24%) were of congenital origin. The 3rd group were due to chemical, thermal, radiation and drug reaction (17.2%). The majority of contracted sockets were of grade IV (32%), where there was severe absence of shrinking of conjunctiva, obliteration of fornices and round both canthi. These cause of congenital anophthalmic sockets are due to failure of optic pit formation (primary) or failure of neural crest formation (secondary) or due to degeneration of optic vesicle formation (consecutive) due to several environmental, physical and chemical factors¹³. The prevalence of anophthalmos is 0.3 per 100,000 birth^{9,13}.

Normal life is possible in primary Anophthalmos, life is not possible in secondary anophthalmos, child is born with anophthalmos and anencephaly and are seen in lab¹. Consecutive anophthalmos are usually associated with other anomalies (Ulrich's syndrome, Golden hart syndrome Hemifacial microsomia, microphthalmos microstomia^{13,14}.

Out of 137 cases, only 126 undergone surgical procedures. Single surgical procedure like symblephera release dermis fat graft, low fornix deepening, mucosa grafting, lid surgery were done in 51.2% cases. 30% (41) cases undergone combined surgical approaches, 11% (15 cases) undergone multiple surgical procedures.

There is 15% reduction in size in anophthalmic side in compare to normal side. Early intervention stimulates the expansion and maximize the facial symmetry and lessen the deformity upto 8%^{7,13}. Majority of our volume deficits cases were treated with dermis fat graft, lower fornix deepening, synechia broken and mucosa grafting^{1,4,8}. An appropriate dermis fat was taken from gluteal region and grafted in the socket by suturing with conjunctiva. The conjunctiva reepithelializes over the front surface of the dermis⁹. The lower fornix sutured with the periostem thus deepening the fornix⁵.

Literature mention about the different types of expander like Antogenous temporal fossa expander^{6,11}, magnet, gold, glass⁹, dental material combo², subperiostial implants like Teflon, Silicon, Siliastic self inflating expanders^{7,9}. Hydrogen expander, Siliastic RTV 382, manual expander were used for the expansion of contracted sockets¹². As our institution is a tertiary center of South India, congenital anophthalmic sockets can be managed by self inflating hydrogen expander inserting into orbital tissues^{8,10,11,12} or manual expander also can be used weekly by parents.

Conclusion

The cosmetic goal in an anophthalmic surgery is to minimize any condition that draws attention to the anophthalmos. An ideal anophthalmic socket should have adequate fornices, well fitted cosmetic procedure and normal length and tension of eyelid.

An acquired contracted sockets can be reduced by proper enucleation and implanting immediate donor sclera covered prosthesis to maintain the volume of the sockets^{7,9}. Conformer should be placed after suturing tenon capsule and conjunctiva.

Congenital anophthalmos needs parents and health staff's patience to deal the case for the long run. Economical condition of patient's party and regular change of operative procedures should be considered in managing congenital cases. Self inflating hydrogen expander, silicon expander, manual expander will be helpful in managing congenital cases in tertiary centers^{8,9,10}.

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