

Reconstruction of Empty Sockets with Sahaf's Orbital Implant

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Purpose: To measure the out come of Sahaf's orbital implant in empty sockets with little or no recognizable extraocular muscles.

Material and Methods: A Quasi Interventional study was done in the department of ophthalmology of Lahore General Hospital Lahore from August 2006 to April 2009. Thirty eyes of 30 patients were included in this study. Sahaf Orbital implant is a polymethyl methacrylate orbital implant. It has pear shaped base, truncated edge. It is inert, cost effective, has no cutting edges and easily available in Pakistan. Three sizes are available to restore volume and enhance support of the prosthesis after implantation. After explaining the procedure a special written consent for surgery and anesthesia was taken by patient. The surgical technique included opening the conjunctiva, tenon and fibrous tissue with a horizontal incision made with Blade No 15. Deepening of the incision to the orbital apex with a blunt tipped pair of scissors. Widening of the wound to the orbital wall by opening the scissors.

Result: Sahaf orbital implant inserted deep to the apex of the orbit with its flat base resting on the orbital floor. Tenon and conjunctiva sutured over implant in two layers separately. Wrapping of Donar sclera or autogenous fascia lata used in most cases.

The patients followed at 4, 8, 12 weeks and 6 months after the operation. The patients received a prosthetic eye after 6 weeks by the ocularist.

Conclusion: All patients had excellent cosmetic results, without any serious side effects. Sahaf orbital Implant has a special design to adjust to different sized orbits. It gives excellent fill to the orbit by using various sizes. It is economical and cost effective. It is readily available to the ophthalmologists in Pakistan. It also gives better adjustment initially to conformer and later to the prosthesis. The technique of implantation is very easy. Any general ophthalmologist can do it very easily.

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E mpty socket is the term given to anophthalmos where no intra-orbital implant has been placed. The three most common causes for acquired (post-surgical) anophthalmos are intraocular malignancy, trauma and painful blind eye¹. Evisceration, enucleation and exenteration are indeed mutilating procedures; however, they are still resorted to in order to save the other eye, to relieve the patient from agonizing pain or to save the life of the patient². Orbital implants commonly being used are; Allen type implants, silicone implants and porous implants³.

Spherical plastic, non-porous and non-pegged porous enucleation implants provide similar motility to implant and prosthetic eye⁴. The reasons for implant choice are cost, outcome and expertise of the surgeon⁵.

Primary orbital implantation with adequate sized Allen type acrylic implant, after tension-free closure of Tenon and conjunctiva gives fairly acceptable cosmetic results⁶. Recently good results have been reported with use of Sahaf Orbital Implant I for primary insertion at the time of enucleation⁷.



Fig. 1: Implant view from above

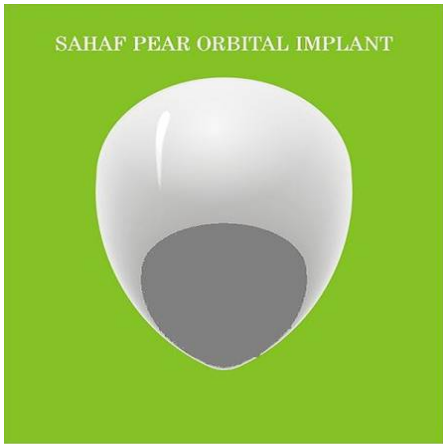


Fig. 2: Implant view from bottom



Fig. 3: Implant view from side



Fig. 4: Socket opened ????



Fig. 5: Implant inserted (wound closure in next step)

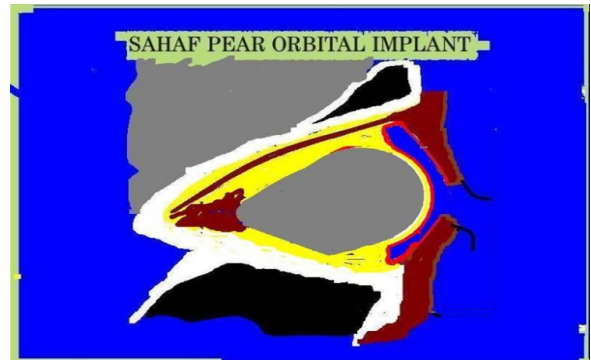


Fig. 6: Diagrammatic representation from side



Fig. 7: Diagrammatic representation from top



Fig. 8: Immediate postoperative view showing orbital fill

In the past it was a practice in Pakistan not to implant the orbit after enucleation of the eye for intra-ocular malignancy or eviscerating the eye for edophthalmitis⁸. The result was, quite a few empty eye socket patients near the adult age seeking cosmetic improvement. To provide volume to a socket where a traditional muscular supported implant insertion was not possible, Prof. Imran A Sahaf (Postgraduate Medical Institute, Lahore) developed this PMMA implant with an ingenious design.

Sahaf Orbital Implant II is a pear shaped implant which rests on the orbital floor and projects up to fill the orbit. It has also been used in the cases of exenterated socket, along with temporalis muscle rotation and with 360° fornix reconstruction using mucous membrane graft.

Aims and Objectives

The objective of study was to record the outcome of Sahaf Orbital implant II, in terms of volume replacement, cosmesis and complications in empty sockets with little or no recognizable extraocular muscles.

METHODOLOGY

Study Type: prospective, Quasi interventional

Duration: three year (August 2006 –April 2009).

Setting: PGMI/Lahore general hospital Lahore, 1200 bedded teaching hospital in the densely populated area of Amr Sadhu Chungi, Lahore.

Population This hospital receives patients from all over Lahore and the neighboring cities in the central Punjab area. However referral cases come from all other provinces.

Inclusion Criteria: All the patients who needed to restore volume of empty anophthalmic sockets or phthisical eyes were included in the study. The patients who needed exchange of implant for various reasons like exposure/excursion, infection or low volume were included in this study.

Exclusion criteria:

Surgical technique:

All the procedures were done by one of the authors (IAS or ZKS). The steps of surgery were as follows:

- Opening the conjunctiva, tenor's fascia and fibrous tissue with a horizontal incision made with Blade No 15.

- Deepening of the incision to the orbital apex with a blunt tipped pair of scissors. Widening of the wound to the orbital wall by opening the scissors.
- Sahaf orbital implant inserted deep to the apex of the orbit with its flat base resting on the orbital floor.
- Tenon and conjunctiva sutured over implant in two layers separately.
- Wrapping of donor sclera or autogenous fascia lata used in most cases.
- A temporary tarsorrhaphy was done for 2 weeks. A pressure dressing was kept on the socket for 1 week. The steps of surgery are shown in (Fig 4-7).

Data Collection and Processing: Hospital patient entry registers and Prof I.A. Sahaf's data base were used to collect the data. All the information was then entered into the computer using the SPSS programme. Entries were double checked and data cleaning was carried out by the investigators.

Analysis method: Statistical analysis was done using SPSS. The data was analyzed according to age, gender, diagnosis, and management. The cosmetic results were defined as good if the patient was able to wear an appropriate sized prosthesis giving palpebral aperture height within 1-2 mm of the other eye. The results were fair if the difference was 2-4mm but still acceptable to patient. Poor result was defined as inability to wear the prosthesis or difference >4mm.

Follow up: The patients were followed at 4, 8 and 12 weeks after the operation. The patients received a prosthetic eye after 6 weeks by the ocularist. The patient had a final follow up at 3 months after the procedure.

RESULTS

Total number of the patients was 30 (30 eyes). Twenty five patients (83%) were male and 5 (17%) female. The age range was 6-60 years. Table 1 shows the age range of the patients. Post-operative results are shown in (Fig. 8,9). The good cosmetic results (Fig 11,12) were noted in 20 cases (67%). Five cases (16.5%) had fair results, while 5 (16.5%) needed further procedures to improve cosmesis.

Two initial cases (6%) had necrosis of the conjunctiva leading to exposure of implant, which needed reinforcement by autogenous fascia lata. Later all those cases who had thin Tenon's fascia had a reinforcement by donor sclera or autologous fascia lata.



Fig. 9: Post-operative appearance after six weeks



Fig. 10: Pre-operative appearance of case 1

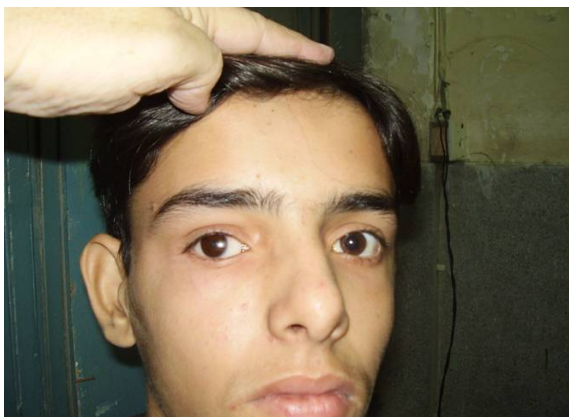


Fig. 11: Post-operative appearance of case 1

DISCUSSION

Reconstruction of the empty socket is a challenging job. Unfortunately due to lack of awareness both among patients and ophthalmologists the socket is left empty for many years and sometimes decades⁸. The patients when reached to the young adult age of

marriage or job search look around to improve appearance. This was obvious from the fact that 80% patients belonged to the age group 16-35 years. According to our literature search no implant which fulfills specific requirements of this group of patients and can be available at an affordable cost has been designed.



Fig. 11: Pre-operative appearance of case 2



Fig. 12: Post-operative appearance of case 1

Table 1: Age range of the patients

| Age group | No. of cases=30 n (%) |
|-----------|-----------------------|
| 6-15 | 2 (7) |
| 16-25 | 20 (76) |
| 26-35 | 4 (13) |
| 36-45 | 3 (10) |
| 46-55 | 1 (3) |
| 56-65 | None |

There have been anecdotal reports of use of acrylic sphere with or without wrapping. Authors have seen follow up of few of these cases, where the implant had migrated into the lower lid thereby obliterating the inferior fornix after a few months. Sahaf orbital implant II (Pear Shaped) having flat lower surface resting on the floor of the orbit does very little migration in the orbit as it was obvious from only 2 cases of exposure and none of extrusion. Moreover, because of the unique design its front surface presents in centre of the palpebral aperture, which is ideal for the prosthetic eye.

As the implant is used in the patient with little or no muscle there is no movement in the prosthetic eye.

However, it is obvious that in these sockets being without an implant for many years the muscles have scarred and would be very difficult to identify. Two third of our patients had good results. Out of 1/3rd half had satisfactory results. Out of the five patients who needed further surgery; two needed fornix deepening procedures, two needed mucous membrane graft to cover exposure and one needed exchange of implant with a smaller implant. Hence all of these patients should be warned about possibility of further procedures after implant insertion.

A series⁹ of 22 cases has been published reporting good results with reconstruction of the anophthalmic contracted sockets with radial forearm flaps. Some of their patients received spherical or conical hydroxiapatite implants. This procedure is more complicated, extensive and expensive, whereas our procedure is more simple and cost effective.

We also had good cosmetic results in most of our cases. However, we excluded complicated cases needing skin and/or muscle flaps from our series. Further studies and long term follow up is needed to establish role of Sahaf Orbital Implant II in socket reconstruction.

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