

# The Dermis Fat Graft: Retrospective Case Series from Pakistan: Our Experience at Al-Shifa

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## ABSTRACT

The case series was conducted at Department of Orbit and Oculoplastic, Al-Shifa Trust Eye Hospital, Rawalpindi, from January 2023 to July 2024. It included 25 eyes of 25 patients who underwent standardized dermis fat graft transplantation for anophthalmia. There were 15 male patients, and the mean age of study participants was  $34.1 \pm 12.01$ . Two out of 25 patients had significant volume loss and were booked for another surgery and 3 had surgical site infection requiring a longer course of antibiotics. All patients reported satisfaction with prosthesis fitting till 6 months of followup. The superior sulcus, lid position and prosthesis tilt was compared to the fellow eye. Dermis fat graft proved to be a good option for anophthalmic socket. It can also be used as a primary procedure for obviously pthysical, traumatic globes.

**Keywords:** Anophthalmos, Dermis Fat Graft, Socket, Orbit, Orbital implant.

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## INTRODUCTION

Restoring volume in a shrunken socket is a challenge to oculoplastic surgeons and ocularists. Dermis fat graft is a rewarding and promising technique for cosmetic and functional rehabilitation of the socket. Due to the long surgical time and a separate, distant surgical site, it has a long learning curve. Many surgeons, due to already overstretched lists, do not engage in learning this technique. However, the results are very promising without the innate side effects of synthetic implants.

The idea of using autogenous fat from the body's natural reserves to fill the orbital socket was envisioned and proposed by Smith and Petrelli in 1978.<sup>1</sup> Since then, it has been used for augmenting

orbital volume. It is very useful in the sense that the fat component provides volume to the socket, while the dermis provides a scaffolding over which the conjunctiva can grow. It serves as a good surface for the prosthesis to sit on.<sup>2</sup> The graft allows vascularization and ingrowth of tissue, which makes its resorption less likely. Being an autogenous structure, it by passes the demerits of synthetic implants. There is no chance of extrusion or migration. Although implants can provide volume to the socket but require multiple surgeries in paediatric cases to cater to the growing face skeleton. In children, fat grafts have been found to grow as the child grows. As a result, the prosthesis is placed along the antero-posterior axis, providing greater facial symmetry. As it is bulkier than the implants, the volume restored is more, and patients can easily wear a thinner prosthesis.<sup>3</sup> This volume provides an impetus for the orbital bones to grow as well, hence promising a better cosmesis as the child grows.<sup>4</sup> Therefore, the Dermis Fat Graft (DFG) fills the socket with adequate volume, increases the lining, reshapes and deepens the fornices. Being an autogenous tissue, it does not require any tests for biocompatibility, transport media, special

equipment, or extensive surgical training for harvesting. This interventional case series provides a short term results of DFG results from a tertiary care center of Pakistan.

## METHODS

This study was an interventional case series from January 2023 to July 2024. It assessed the outcomes of DFG for an-ophthalmic-sockets. The research was conducted at the Department of Orbit and Oculoplastic, Al-Shifa Trust Eye Hospital Rawalpindi. This tertiary care facility is well-equipped with comprehensive ophthalmic services and a dedicated ocularist, making it an ideal setting for this study. The institutional review board approval (**ERC-12/AST-25**) was sought before study. All patients were enrolled by retrospective assessment of hospital records. Only the patients with complete data were selected. Data retrieved included demographic variables like age, gender, laterality of the operated eye, and past interventional history of either surgery and /or radiotherapy. The cases with anophthalmia due to any reason and good general health with a post-operative follow up at 2 weeks, 6 weeks, 3 months and finally 6 months, were included. The exclusion criteria were systemic comorbidities to prevent surgery, keloid, hypertrophy of scar, discharging socket and severe lid trauma. Twenty-five cases fulfilled the inclusion criteria. Primary DFG was defined as insertion of DFG immediately after enucleation or evisceration. Secondary DFG denoted a history of implant placement in the socket, followed by implant removal and DFG. Lack of volume in the socket was defined as a deep superior sulcus even with the external prosthesis in place.

Surgery involved measurement of socket depth and fornices. Measurements were taken in vertical and horizontal dimensions. Scar tissue was released and space created within the socket. Fornix-forming sutures were placed with 4-0 silk, using bolsters when deemed necessary by the operating surgeon. To harvest the graft a circular marking was made with a surgical marker, ensuring the diameter of the graft did not exceed 25 mm. The chosen site was the upper outer quadrant of the gluteal area. The mark was then enclosed in an elliptical shape to ensure adequate closure afterwards. A subcutaneous injection of 1% lidocaine with 200,000 adrenaline was given with a long 25 G needle, ensuring a bleb was raised and a peau "d" orange appearance at the marked site. The

epidermis was then shaved off via a 15-0 blade on a BP handle. It was gently taken off, revealing underlying dermis with a whitish colour and punctate haemorrhages. Once done, the blade was directed vertically downwards into deeper tissue to cut through fat. Scissors were used to lift off the graft. Haemostasis at the donor site was maintained with bipolar cautery. The wound was then closed with prolene 4-0 on a ½ circle, round-body needle, employing horizontal mattress sutures.

The graft tissue was trimmed according to the desired size and placed in the socket space. The conjunctiva was sutured via an interrupted 6-0 vicryl spatulated needle to the dermis of the graft. An adequately sized conformer was placed on top, and lids were closed with temporary tarsorrhaphy. A pressure bandage was applied for 48 hours. The patients were discharged on oral antibiotics for 5 days, topical antibiotic and steroid combination drop at qid for 6 weeks, and ointment at night. General wound care was advised. Leg sutures were removed at 10 days after surgery. All patients were seen 2 weeks postoperatively, then at 4 weeks for adequate sizing by the ocularist. The final prosthesis was placed at 6-8 weeks. All patients had their photographs taken at each visit.

## RESULTS

A total of 25 patients fulfilled the criteria. There were 15 males and 10 females. The mean age was  $34.1 \pm 12.01$  years (range 3 to 53 years). All patients reported satisfaction with prosthesis fitting till 6 months of follow-up. The superior sulcus, lid position and prosthesis tilt was assessed compared to the fellow eye. Photographs were taken at each visit. Two patients had significant fat resorption, leading to marked volume loss which required further surgery. Three patients had a conjunctival infection which responded well to one week's course of topical antibiotics. (ED Tobradex, qid, 7 days). None of the patients had any problems at the donor site.

## DISCUSSION

This study showed that DFG proved to be a good option for anophthalmic sockets. It can also be used as a primary procedure for obviously phthisical, traumatic globes as well as secondary procedure with success until 6 months of follow up.

Dermis fat graft for the management of an



**Figure 1:** Preoperative and postoperative picture of a patient who underwent DFG.

anophthalmic socket has been used for over five decades. It is a composite graft with the fat component providing adequate volume to fill the pear-shaped orbit while the dermis allows the conjunctiva or deeper muscles to be sutured to it. It also provides a good surface for a prosthesis to sit on. There is no chance of any rejection as it is immunologically protected due to autologous nature. The dermis takes on the nature of the host environment. Another potential advantage is that the bigger grafts allow deepening of the fornix, facilitating an anterior placement of the prosthesis compared to silicone implants. Hence, the prosthetic



**Figure 2:** Graft in place showing adequate volume.



**Figure 3:** Pre and Postoperative photograph with conformer in place showing good volume after surgery.

eye can be thinner and result in fewer episodes of ectropion correction in the patient's lifetime.<sup>5</sup> However, for an average ophthalmic surgeon, it is still a challenging technique due to the long surgical time, the creation of a distant surgical wound, and intensive follow-up.

In our study, the size of the graft purposely exceeded the size of the defect to account for the expected tissue resorption which is reported in literature.<sup>6</sup> On follow-up it was found that graft shrinkage did occur. We assessed prosthesis position and superior sulcus compared to the fellow eye. Kuzmanović El-Abjer et al, had a similar outcome.<sup>6</sup>

However, the resorption of the graft was mostly accounted for by the prosthesis. Only 2 of our patients had to be relisted for a regrant due to significant graft shrinkage. The reason could be the history of previous radiation to the socket in these patients. The radiated bed does not allow the graft to vascularize as well as a non-radiated bed. Even with the most meticulous surgery, 25-35% of graft atrophy occurs in the first 6 months. Resorption is greater if the host socket had trauma, radiation, infection, or scarring.<sup>7</sup> Longer follow-up is needed to assess outcomes in all patients.

In patients suffering from chronic implant-related pain and socket problems, DFG provides a good

option with increased patient comfort.<sup>8</sup> Patient satisfaction is the most rewarding aspect of this surgery. Numerous studies have elaborated that anophthalmic patients have increased levels of anxiety, depression, somatization, and other effects.<sup>9</sup> Use of a prosthesis leads to significant improvement in the quality-of-life index of such patients. We recorded 100% satisfaction by all our patients in the overall outcome compared to pre-surgery.

Another merit is that the patient age is not a limitation factor for DFG. In the current study, DFG was performed in patients ranging from 3 years to 53. A similar observation was done at other centres. A broad age range was also elaborated by Galindo et al.<sup>10</sup> Satisfactory cosmetic results are present across the entire patient cohort from youngest to the oldest. In fact, in the paediatric age group, it has the advantage of graft growth and fat hypertrophy. This also signals orbital bones to grow. Due to concomitant growth of orbital bones and fat graft, better and balanced cosmesis achieved. In contrast to synthetic spherical implants, which need replacement with a larger diameter after a few years, children are saved from implant-related complications and repeated surgeries.<sup>3,10</sup>

The present study has several limitations. Being a single-centre case series with a small sample size, its findings may not be generalizable to broader populations. The follow-up period was limited to six months, which may not capture long-term complications, graft stability, or changes in prosthesis fit. The absence of a control group and reliance on subjective patient satisfaction scores may introduce bias in outcome assessment. Variations in surgical technique or postoperative care were not evaluated, which could influence results. Future studies with larger, multicentre cohorts, longer follow-up, and objective outcome measures are recommended to validate and expand upon these findings.

## CONCLUSION

Autologous dermis fat graft into anophthalmic sockets is a promising technique which proved to have a lot of merits across a broad age range.

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**Conflict of Interest:** Authors declared no conflict of interest.

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### **Authors Designation and Contribution**

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