

Prosthetic Rehabilitation of Patient with Ocular Defects using Conventional Technique: A Systematic Review

Vinsensia Launardo¹, Rifaat Nurrahma², Rezki Wahyuni Syamsuddin¹, Acing Habibie Mude¹, Bashiera Ika Sari¹

¹Department of Prosthodontic, Faculty of Dentistry, Hasanuddin University, Makassar, Indonesia

²Department of Oral and Maxillofacial, Vrije University Medisch Centrum, Amsterdam, The Netherlands

Corresponding Author: vlaunardo@gmail.com

ABSTRACT

This study's objective is to assess the current scientific evidence on the use of prosthetic rehabilitation of patients with ocular defects using the conventional technique. Electronic PubMed and Google Scholar searches were conducted to identify relevant articles from January 2015 until December 2019, focusing on Prosthetic rehabilitation of patients with ocular defects. There are 790 journals explained about this, with 80 articles met the inclusion criteria for the articles. They yielded 790 articles. A total of 80 studies were met inclusion criteria, with 315 patients as subjects. All of the studies were conducted in the past 5 years, and most conducted in Asia (75), followed by South America (3), Europe, and Africa (1). Most of the studies were using fabrication ocular prosthesis custom made, with 3 studies used stock ocular prosthesis and 16 studies used stock custom. There were 87,94% of studies used fabrication ocular prosthesis custom made. The aesthetic aspect of the custom-made ocular prosthesis was far better than the stock ocular prosthesis. It also a simple and cost-effective method and results in a more esthetically pleasing and accurate prosthetic outcome.

Keywords: Custom, Fabrication Technique, Impression Technique, Ocular Prosthesis, Ocular Prosthetic.

Correspondence:

Vinsensia Launardo

¹Department of Prosthodontic, Faculty of Dentistry, Hasanuddin University, Makassar, Indonesia

Corresponding Author: vlaunardo@gmail.com

INTRODUCTION

The eye is playing important role in the component of facial expressions yet is main organ in terms of vision. Damage due to eye loss resulted significant physical and emotional problems. Losing one will win the eye will make the patient's visuals also produce obvious deformities. This condition can be caused due to congenital disabilities, the trauma that cannot be repaired, tumors, sore eyes and eyes, sympathetic ophthalmia.¹ Replacement of the lost eye as soon as possible is needed to help physical and psychological healing for the patient and to increase social acceptance.² Rehabilitation of patients suffering from psychological trauma due to eye loss is done by making a prosthesis that will provide optimal functional good cosmetic results. Ocular prosthetics made from cryolite or perspex glass can be made and installed 1-2 months after eye removal. During this time, the conformer is placed in the conjunctival sac to prevent scar formation and the socket's shrinkage.³ Ocular prosthetics act as natural eyes. Despite, it cannot provide vision, it provides eye sockets for cosmetic enhancements. It also enhances the psychological side, and social interaction.⁴ Prosthetic rehabilitation could be done either with prefabricated prosthesis or custom made ocular prosthesis.⁵ Custom-made prostheses have several advantages over prefabricated prostheses such as better eyelid movement, improved pressure distribution for a comfortable fit, and excellent adaptability resulting in improved facial contours, and the aesthetics gained from control over iris size and iris color and sclera.⁵ This systematic review will be explained about current fabrication for an ocular prosthesis in some studies all over the world.

MATERIAL AND METHODS

This systematic review was written according to PRISMA guidelines (Preferred Reporting Items for Systematic reviews and Meta-Analyses) for reporting studies evaluating healthcare interventions.⁹ This study aimed to systematically review the available literature to answer the focused 'PICO' with the population is patient with ocular defect, intervention is an ocular prosthesis, the

comparison is fabrication technique stock, stock-custom, and custom, outcomes is therapy.

Search Strategy

A systematic literature search was conducted using the combined MeSH browser "fabrications technique" and "ocular prosthesis" and "impression technique" and limited by "English." The publication date is 5 years in the database. The electronic search also conducted using Pubmed and Google scholar with the same keywords.

Eligibility Criteria

The inclusion and exclusion criteria in this systematic review were the following:

Inclusion Criteria

- Any clinical study published from January 2015 - December 2019.
- That studies included information about type impression technique ocular prosthesis (conventional impression)
- Published in English

Exclusion Criteria

- Animal studies
- Paper without full text

Selections of Study

All specific keywords were used by three authors (RW, VL, and RN) resulted in papers based on a reading of abstract and full-text. Independently, the three investigators selected the paper based on inclusion criteria formerly set. After that, all abstracts and full-texts were downloaded and individually evaluated.

Extraction of Data

At the outset, three independent reviewers (RW, VL, and RN) evaluated the articles' selection according to the inclusion and exclusion criteria. Extracted data were the fabrication technique and the impression technique.

RESULT

Prosthetic Rehabilitation of Patient with Ocular Defects using Conventional Technique: A Systematic Review

The database search resulted in 790 articles, including 38 from PubMed and 752 from Google Scholar. After removing duplicates references, there were 185 articles remained. The titles and abstracts were reviewed afterward, and 170 articles were eligible for further analysis. The full-texts then be reviewed by the investigators and yielded 80 articles that met the inclusion criteria. The flowchart of article selection is shown in figure 1, with a total of 80 selected articles from the initial yield of 790 studies by the electronic literature search. After 790 titles reviewed, 80 articles were selected for this systematic review inclusions, whereas the other 710 articles were excluded for some different reasons.

All of the studies were conducted in the past 5 years, and most conducted in Asia 75, followed by South America 3, Europe, and Africa 1. A total of 315 patients were included in these 80 studies, with most patients came from Europe (131). The majority of the studies (62/80) were using custom made fabrication for an ocular prosthesis. This means that 87,94% of all the cases were using custom made fabrication for ocular prosthesis, while the other 11% cases were using stock-custom fabrication for ocular prosthesis, and 0.95% cases were using stock fabrication the ocular prosthesis.

Table 1 showed a seventy-four-case report, three clinical reports, two prospective studies, and one cross-sectional study. The study mostly done in 2017, followed by 2018, 2015, 2016, and 2019. The study mostly by gender is Male with 207 patients and then female 108 patients. Most of the patients over 60 years of age, while there was a patients 51-60 years old, 50 patients about 41-50 years old, 44 patients about 31-40 years old, 34 patients about 21-30 years old, 25 patients about 11-20 years old and 14 patients about ≤10 years old. In these 80 studies, mostly cause loss of an eye is traumatic, after that because infected or other and then congenital. The study, mostly by fabrication technique with a custom-made ocular prosthesis, followed stock-custom ocular prosthesis and stock ocular prosthesis. The most therapy is ocular prosthesis with 305 patients in 80 studies and orbital prosthesis 10 patients.

CONCLUSION

The aesthetic aspect of the custom-made ocular prosthesis was far better than the stock ocular prosthesis. It also a simple and cost-effective method and results in a more esthetically pleasing and accurate prosthetic outcome. The following conclusion can be drawn within the limitation of this Systematic Review, such as the study most conducted in Asia, followed South America, Europe, and Africa, the most patients came from Europe, with

total 131 patients, the study mostly by gender is Male with 207 patients (65.71%), most of the patients over 60 years of age (26.98%), and fabrication ocular prosthesis was used in most cases of patients with custom made ocular prosthesis.

REFERENCES

1. Somkuwar, K., Mathai, R., & Jose, P. (2009). Ocular prosthesis: patient rehabilitation: a case report. *People's Journal of Scientific Research*, 2(2), 21-6.
2. Barman, J., Goswami, B., & Paul, N. (2018). Rehabilitation of ocular defect with custom-made ocular prosthesis-A case report. *J Med Radiol Pathol Surg*, 5, 19-22. <https://doi.org/10.18231/2395499X.2017.0050>
3. Koch, K. R., Trester, W., Müller-Urri, N., Trester, M., Cursiefen, C., & Heindl, L. M. (2016). Ocular prosthetics. Fitting, daily use and complications. *Der Ophthalmologe: Zeitschrift der Deutschen Ophthalmologischen Gesellschaft*, 113(2), 133-142. <https://doi.org/10.1007/s00347-015-0091-x>
4. Hatamleh, M. M., Abbariki, M., Alqudah, N., & Cook, A. E. (2017). Survey of ocular prosthetics rehabilitation in the United Kingdom, part 1: anophthalmic patients' aetiology, opinions, and attitudes. *Journal of Craniofacial Surgery*, 28(5), 1293-1296. <https://doi.org/10.1097/SCS.00000000000003370>
5. Krishna, M., Mohapatra, A., & Choudhury, G. K. (2019). Prosthetic Rehabilitation of Ocular Defect: A Case Report. *Indian Journal of Public Health Research & Development*, 10(9), 1648-1651. <http://dx.doi.org/10.5958/0976-5506.2019.02690.1>
6. Dipoyono, H. M., Sarjono, G. S., Sakti, I. A., & Lina, P. S. (2017). Prosthetic Rehabilitation for the Missing Bulbus Oculi Due to Eye Enucleation (Fabricated and Non-Fabricated). *Madridge J Dent Oral Surg*, 2(1), 38-40. <https://doi.org/10.18689/mjdl-1000109>
7. Gupta, R., & Aggarwal, B. (2019). Prosthetic management of Ocular Defect-Case Report. *Journal of Advanced Medical and Dental Sciences Research*, 7(8), 129-131. <https://doi.org/10.21276/jamdsr>
8. Suchitra, S. R., & Kumar, P. Custom-made Ocular Prosthesis: A Case Report.
9. Dos Santos, D. M., Andreotti, A. M., Iyda, B. G., Dekon, S. F. D. C., & Goiato, M. C. (2017). Expander eye prosthesis assisting ocular rehabilitation in child with eye loss. *Journal of Clinical and Diagnostic Research: JCDR*, 11(8), ZD06. <https://dx.doi.org/10.7860%2FJCDR%2F2017%2F26859.10511>

*Prosthetic Rehabilitation of Patient with Ocular Defects using Conventional Technique:
A Systematic Review*

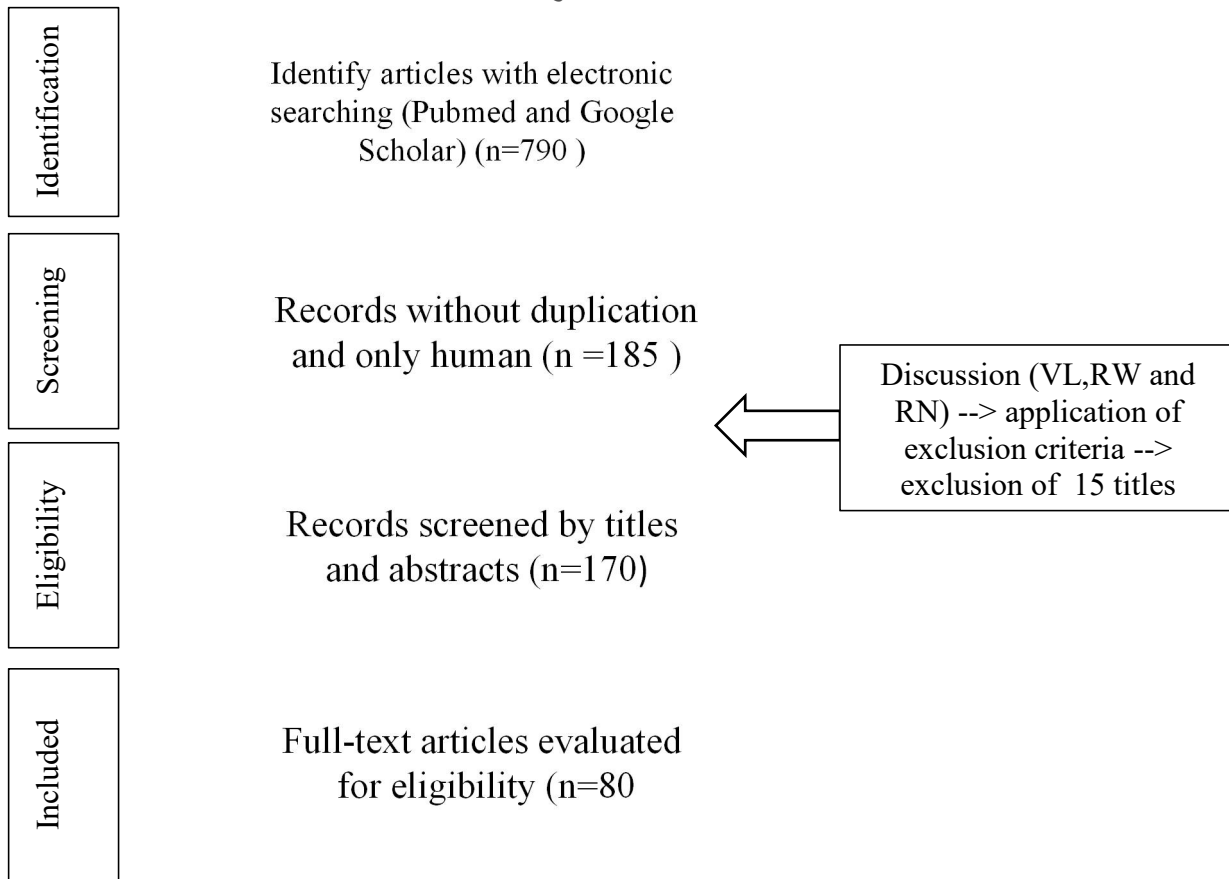


Figure 1: PRISMA flow chart

*Prosthetic Rehabilitation of Patient with Ocular Defects using Conventional Technique:
A Systematic Review*

Table 1. Descriptive data from the 80 included studies that reported on using of ocular prosthesis

Author	Publication Years	Country	Study Design	Number of patient
A Meenakshi et al	2019	India	case report	1
Haryo M. Dipoyono et.al	2017	Indonesia	case report	1
Renu Gupta, Abhishek et. al	2019	India	case report	1
S. R. Suchitra et. al	2018	India	case report	1
Daniela Micheline Dos Santos et. al	2017	Brazil	case report	1
Himanshi Aggarwal et. al	2015	India	case report	1
Nancy Singla et al et. al	2018	India	case report	1
Muhammad Waseem Ullah Khan et. al	2017	Pakistan	case report	1
Darshana Shah et. al	2016	India	case report	1
Hai Phan Hoang et. al	2018	Thailand	cross-sectional study	82
Iheukwumere Duru et. al	2018	United Kingdom	prospective study	131
Saamyendra V Singh et. al	2018	India	case report	1
Neha Verma, Ashish Saxena et. al	2016	India	case report	1
Himanshu Gupta, Geeta Verma et. al	2017	India	case report	1
Dolanchanpa Dasgupta et. al	2019	India	case report	1
Lui sa Fernandes Monken elho et. al	2018	Brazil	clinical report	1
Godwin Clovis Da Costa et. al	2017	India	case report	1
Dr. Apurva Deshmukh et. al	2016	India	case report	1
Jaswinder Kaur	2017	India	case report	1
Amaey A. Parekh et. al	2016	India	case report	2
Keziah Nanier Malu et. al	2015	Nigeria	prospective study	18
Washim Akram et. al	2017	India	case report	1
Srinivasa B.Rao et. al	2017	India	case report	1
Rajat Lanzara, Ashish Thakur et. al	2019	India	case report	1
Gayatri Shankaran et. al	2016	India	case report	1
Vinit shah et. al	2015	India	case report	1
Chetan Pathak et. al	2017	India	case report	1
Asikul Wadud et. al	2015	Malaysia	case report	1
Sumeet Jain et. al	2015	India	case report	2
Prana Shakya et. al	2016	Thailand	case report	1
Nafij Bin Jamayet et. al	2015	Malaysia	Clinical Report	1
Harshad D Wagaj et. al	2016	India	Case Report	1
Dr. Shubhangi Pandurang Lohande et. al	2018	India	Case Report	1
Kamalakanth Shenoy et. al	2015	India	case Report	1
Jogeswar Barman et. al	2019	India	case Report	1
Vishwas Kharsan et. al	2018	India	case Report	1
Sabzar Abdullah et. al	2017	India	case Report	1
Ajay Pandey, Siddhart Gupta et. al	2019	India	case Report	1
S. R. Suchitra et. al	2018	India	case Report	1
Jogeswar Barman et. al	2019	India	case Report	1
Sahil Sarin et. al	2015	India	case Report	1
Pankaj Kharade et. al	2017	India	case Report	1
Milap H Karia et. al	2017	India	case Report	1

*Prosthetic Rehabilitation of Patient with Ocular Defects using Conventional Technique:
A Systematic Review*

Anshuraj Kopal Ashok Kumar Das et. al	2015	India	case Report	1
Anna Serene Babu et. al	2015	India	case Report	3
Namrata shah naidu et. al	2017	India	case Report	1
Nancy Singla et. al	2018	India	case Report	1
Ankita Chamaria et. al	2017	India	case Report	1
Dr. Viral H. Gada et. al	2016	India	case Report	1
Dr. Avinash Kumar et. al	2017	India	case Report	1
Pallavi V. Chavan et. al	2017	India	case Report	1
Niharika Yadav et. al	2018	India	case Report	1
Taseef Hasan Farook et. al	2019	Malaysia	case Report	1
Rahul Vishnoi et. al	2015	India	case Report	1
D. Kalpana et. al	2018	India	case Report	1
Namika Sokhal et. al	2019	India	case Report	1
Sunil Chandra Tripuraneni et. al	2015	India	case Report	1
Ramesh Murthy et. al	2018	India	case Report	1
Ankita Chamaria et. al	2017	India	case Report	1
Sushant M. Patil et. al	2017	India	case Report	1
Mohit Bhatnagar et. al	2018	India	case Report	1
Brajendra S. Tomar et. al	2018	India	case Report	1
Darshana Choubisa	2017	India	case Report	1
Aditya Anil Kavlekar et. al	2017	India	case Report	1
Varun Baslas et. al	2015	India	case Report	1
Prashant A. Karni et. al	2017	India	case Report	1
Indra Kumar Limbu et. al	2019	Nepal	case Report	1
Sanath Shetty et. al	2016	India	case Report	1
Vikram Belkhode et. al	2018	India	case Report	1
Surya Narayan Pun et. al	2016	Nepal	case Report	1
Singh T et. al	2018	Nepal	Clinical Report	1
Dr. Varsha Ignatious et. al	2018	India	case Report	1
Dr. K Vinayagavel et. al	2015	India	case Report	1
Anuradha G.	2015	India	case Report	1
Srinivasa B. Rao et. al	2017	India	case Report	1
Sumit Kumar Chattopadhyay et. al	2016	India	case Report	1
Dr Subhash Sonkesriya1 et. al	2016	India	case Report	1
C.F. Amaral et. al	2016	Brazil	case Report	1
Nishtha Agrawal et. al	2018	India	case Report	1
Neetu Singh et. al	2017	India	case report	4

Table 2. Patient characteristics of the reviewed studies

Factors	Number of Patients	Percentage
Gender		
Male	207	65.71%
Female	108	34.29%
Total	315	
Age Group		
≤10	14	4.44%
11-20	25	7.94%
21-30	34	10.79%
31-40	44	13.97%
41-50	50	15.87%
51-60	63	20.00%
>60	85	26.98%
Total	315	
Cause of loss eye		
Traumatic	119	37.78%
Infection & other	93	29.52%
Congenital	25	7.94%

Table 3. Ocular prosthesis characteristics of the reviewed studies

Factors	Number of Patients	Percentage
Fabrication		
Stock	3	0.95%
Stock-Custom	35	11.11%
Custom	277	87.94%
Total	315	
Therapy		
Ocular prosthesis	305	96.83%
Orbital prosthesis	10	3.17%
Total	315	