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Original Research Article

Evisceration with primary orbital implant in endophthalmitis/ panophthalmitis

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ABSTRACT

Aim: To describe the outcome of Evisceration with the primary orbital implant in non-seeing eyes with and without ocular infection (endophthalmitis/panophthalmitis).
Materials and Methods: A prospective, nonrandomized comparative case series research was performed from 2019 to 2022. Patients with the least postoperative follow-up of 6 months were included in the study. One seventy-three eyes of one seventy-three patients were included. Group A involved the infective patients, and Group B included all noninfective blind eyes. Nonporous PMMA implants were used for all cases, and the main outcome measure was the successful retention of the primary implant. All types of complications and satisfactory prosthesis fitting were also observed.
Results: The mean (±SD) age was 45.689 ± 11.34 years, with males (53.2%) predominant. All except 11 cases could retain the primary implant successfully. Primary orbital implants were exposed in nine (5.2%) cases (four in Group A and five in Group B), and Extrusion of the primary orbital implant occurred in two (1.1%) cases, and all extrusion occurred in Group A. One hundred fifty-six (90.2%) patients underwent successful prosthesis fitting with better cosmesis. The difference in major complications like implant exposure and implant extrusion between the groups was not statistically significant (P value equals 0.0879, Fisher exact test).
Conclusion: Evisceration with a primary orbital implant is feasible in both infective (endophthalmitis/ panophthalmitis) and noninfective blind eyes. It provides a better postoperative cosmesis to the anophthalmic socket.

1. Introduction

Endophthalmitis is a pyogenic bacterial infection of the intraocular compartment within the vitreous and often involves the cornea. In severe cases, the uncontrolled infection can involve the ocular and periocular tissue invading the sclera, termed Panophthalmitis.[1,2] Endophthalmitis can be categorized as endogenous and exogenous by the source of the infection. Endogenous Endophthalmitis occurs from the hematogenous spread of microorganisms from a remote source of infection.

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Exogenous Endophthalmitis occurs with the direct invasion of a microorganism from the external source by a complication of ocular surgery, an ocular foreign body, or penetrating ocular trauma.[3] Endophthalmitis and panophthalmitis are serious eye diseases that can threaten vision and even be life-threatening.[4] Initially, medical treatment, including a systemic and local broad spectrum of antibiotics and analgesics, is the mainstay of treatment to control infections and inflammations. A recent study reported that enucleation or Evisceration indicates blind eyes with Endophthalmitis. Orbital implantation may help to get acceptable outcomes in these patients.[5] The choice of enucleation and Evisceration to remove an eye and the timing of the placement of an implant material remain controversial in conditions like a huge burden of functional deficit and physiological and psychological trauma. Why a patient will suffer a lot, an Oculoplastic surgeon should resolve the problems. Often reported that the advantage of Evisceration is simpler and faster than enucleation surgery. Evisceration provides less operative time, less disruption of orbital tissues, leaves the extraocular muscles and optic nerve intact, and has less risk for significant bleeding. Evisceration resulted in better implant stability and prosthetic motility, a feasible surgical option for painful blind eyes due to Endophthalmitis/Panophthalmitis. Evisceration is quite challenging in the cases of phthisis bulbie.[5,6] Continuous advancements in microsurgery and medicinal treatments have led to a decline in the general mean yearly prevalence of enucleations over the past 25 years, while the occurrence of serious ocular trauma and ocular cancer (frequently inherited) has remained relatively steady. Meticulous Evisceration with the well-fitted primary orbital implant in the scleral socket or muscle cone followed by a custom-made ocular prosthesis may help her cosmesis outcome and overcome the psycho-social trauma.[6] Without an implant, it causes facial asymmetry and disfiguring. Here, we attempt to describe the outcome of Evisceration with primary orbital implantation in both infective and noninfective blind eyes.

2. Materials and Methods

A prospective, nonrandomized comparative case series research study was performed from January 2019 to December 2022. All patients who had followed up at least six months after Evisceration with primary orbital implantation were included in the study. One sixty-one eyes of one sixty-one patients were included. Group A involved 43 painful blind eyes due to Endophthalmitis (Figures 1 and 2) or panophthalmitis (Figures 3 and 4) of 43 patients, and Group B included all 130 noninfective blind eyes of 130 patients. Thorough clinical assessment plays a key role in diagnosing endophthalmitis and panophthalmitis. CT scan (Figure 5) or MRI of the Orbit was indicated for the suspecting panophthalmitis cases and advised in a few cases to exclude ocular tumors. Nonporous PMMA orbital implants were introduced into the scleral socket for all cases to get the optimum orbital volume, prosthesis motility and cosmesis. The main outcome measure was the successful retention of the primary implant. All complications, including Extrusion, implant exposure and unsatisfactory prosthesis fitting, were also observed.

2.1. Key points of Evisceration for Endophthalmitis/ Panophthalmitis

Initially, Conjunctiva is inflamed, friable, and conservative treatment with systemic antibiotics and analgesics is needed to settle down the infection and inflammation in severe infective cases. Placing a conformer at the end of Evisceration followed by Temporary tarsorrhaphy. The key points are mentioned below:

1. 360° Peritomy with limited tenotomy and Keratectomy.
2. Removal of all uveal contents and necrosed tissue.
3. Swab the sclera with 5% Povidone Iodine and 0.9% NaCl.
4. Two petal/4 petal sclerotomy with/without peri-optic nerve sclerotomy.
5. Optimum size Primary Orbital Implantation.
6. Two stages of suturing to close the scleral opening.
7. Tenons and Conjunctiva are sutured layer by layer or jointly.

3. Results

Of one hundred seventy-three eyes, forty-three were infective, and 130 were noninfective. The mean (±SD) age was 45.689 ± 11.34 years, with an age range from 5 years to 83 years. The male was 92 (53.2%), and the female was 81 (46.8%). There were statistically insignificant (P Value >0.05) between the mean age of the two groups of patients. The causative factors of the patients with endophthalmitis and panophthalmitis (Table 1) include exogenous (76.7%) and endogenous (23.3%).

162 (93.6%) eyes could successfully retain the primary implant (Figure 6). Uncontrolled Diabetes was found in 5 (45.4%) cases as the risk factor among the nine Implant Exposure/Extrusion cases. Exposure and Extrusion of the implant were the main complications (Table 2), and postoperative inflammation is the main issue for exposure/Extrusion. Corticosteroid is contraindicated in uncontrolled diabetic cases, and controlling inflammation is often challenging. The results between the groups were statistically insignificant (P value was >0.05, Fisher exact test) in major complications like implant exposure (Figure 7) and Extrusion.

Primary orbital implants were exposed in four cases (9.3%) in Group A and five cases (3.8%) in Group B). Extrusion of the primary orbital implant occurred in two

Table 1: An analysis of the reasons for the spread of infectious cases.

Causes	Endophthalmitis	Panophthalmitis	Total
Exogenous	25 (75.5%)	08 (24.5%)	33 (76.7%)
Endogenous	07 (70%)	03 (30%)	10 (23.3%)
Total	32 (74.4%)	11 (25.6%)	43

Table 2: The distribution of complications from evisceration.

Variable	Exposure	Extrusion	Total
Infective, 43 (Group A)	04	02	06 (13.9%)
Non-infective, 130 (Group B)	05	00	05 (3.8%)
173 cases	09 (5.2%)	02 (1.1%)	11 (6.3%)

Fig. 1: a,b: Two patients suffer from painful, blind eyes due to endophthalmitis.

Fig. 2: a,b,c: Three patients have been diagnosed with endophthalmitis, resulting in no light perception in their left eyes.

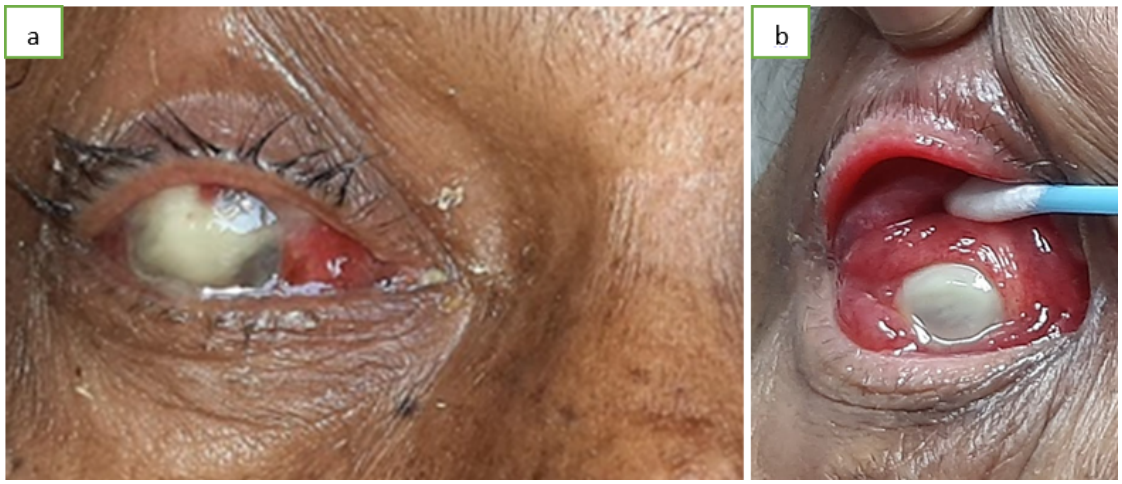

Fig. 3: a,b: Shows two patients' infected right eyes with panophthalmitis.

Fig. 4: A 33-year-old woman presents with swollen, tender eyelids, severe chemosis, blood crust on the ocular surface, and a slough-out corneal ulcer indicative of panophthalmitis in the right eye.

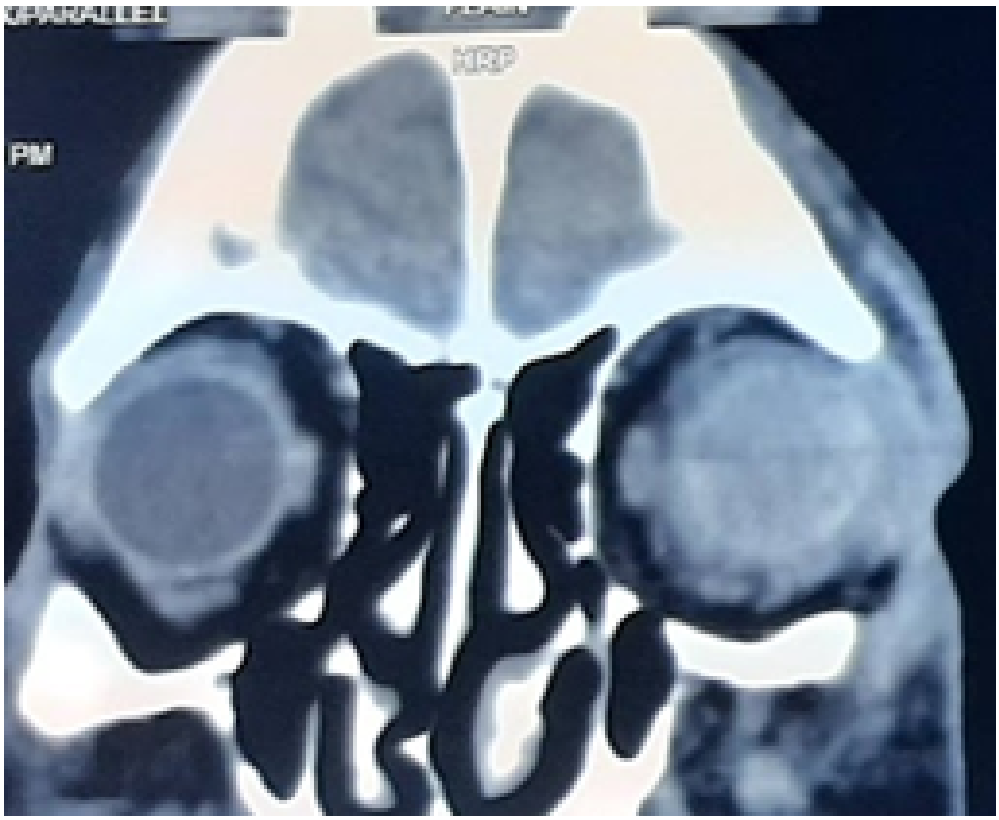

Fig. 5: A CT scan of the eye shows thickened sclera and intraocular contents, indicating panophthalmitis.

cases (4.6%) of Group A. After fitting an ocular prosthesis, better cosmesis was observed in One hundred fifty-six (90.2%) patients. In infective cases, the postoperative pain was moderate to severe for up to seven days, with mild pain lasting up to 14 days. But in noninfective cases, severe pain was felt up to 4 days of surgery, and mild to moderate pain was felt with medication for up to 7 days.

4. Discussion

Recently, Evisceration has become the preferred surgical technique for panophthalmitis because of its short operating time and efficient and significant reduction in disease burden. The intact scleral shell reduces the risk of orbital implant extrusion, enhances prosthetic mobility, and improves cosmesis. Before planning for an evisceration, a careful radiological assessment for a scleral abscess is necessary since panophthalmitis is an infection beyond the

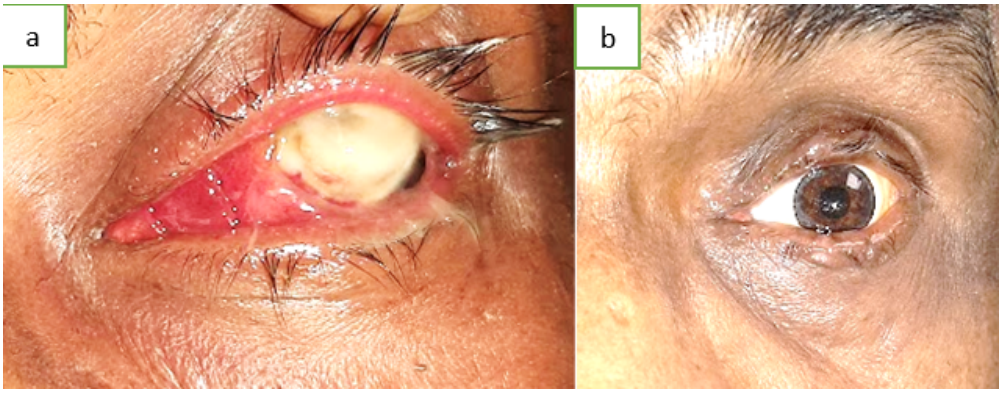

Fig. 6: a,b : The patient has an ocular infection (**a**) and underwent evisceration with a primary orbital implant in the right eye, followed by a well-fitting ocular prosthesis (**b**).

Fig. 7: a,b,c: Exposing the implants.

globe.

Enucleation is a surgical procedure that involves removing the entire eye and the optic nerve closest to it. This procedure is beneficial because it completely removes the infected eye and tissue and reduces the risk of developing sympathetic ophthalmia. There are risks of orbital implant exposure and extrusion as the tenon's fascia and conjunctiva only cover the implant.[7]

The most frequent causative factors of infectious painful blind eyes in this study include exogenous (76.7%). Endogenous endophthalmitis is less common than exogenous endophthalmitis. However, the proportion of endogenous endophthalmitis varies widely (2% to 41%) in different reports.[8–11] Secondary orbital implantation requires more than one sitting surgery and a high complication rate, Secondary orbital implantation requires more than one sitting surgery and a high complication rate. In contrast, a primary orbital implant is a single sitting surgery, reducing the risks of two separate surgeries, providing early initiation of rehabilitation, and facilitating optimal ocular cosmesis.[12,13]

In the pre-antibiotic era, Secondary Orbital Implantation was the only choice after settling down the inflammation and infections. Preoperative, Perioperative, and postoperative antibiotics are in all cases of Evisceration in the setting of endophthalmitis/panophthalmitis. Antibiotic therapy is usually administered for 14 days, depending on the nature of the infection.[14] Surgeons often change instruments and gloves before implant placement and closure to reduce contamination and infection risk.[14,15]

The outcome of surgery depends on variable factors like the use of prophylactic antibiotics and analgesics to control infection and inflammation. Aqueous and vitreous tap for culture and sensitivity, KOH staining to confirm antibiotic sensitivity, and nature of the infection. Control of Diabetes is important for better outcomes. Uncontrolled diabetes causes extrusion and exposing the orbital implant due to poor wound healing in five (2.9%) cases of our case series. Anticoagulant therapy should be stopped five days before surgery to control perioperatively bleeding and reduce postoperative hematoma.

In our case series, Extrusion and implant exposure were observed in eleven (6.3%) cases, and most of the patients were satisfactory (93.6%), and better cosmesis was achieved in 90.2% of cases. There was no significant difference between the infective and noninfective cases. Primary Orbital Implantation has been frequently performed with acceptable outcomes, including a low rate of implant exposure or extrusion and rare postoperative infections due to the availability of broad-spectrum antibiotics, anti-inflammatory and cortico-steroids drugs, bio-integrated orbital implants, and the development of surgical skills and equipment.[16]

After 2000, Literature reported that the implant's rate of extrusion/exposure is three to nine per cent following Evisceration with primary implantation in endophthalmitis/panophthalmitis.[12,17–20] In the pre-antibiotic era, the extrusion or implant exposure rate was

26% on 192 reported cases from 1982 to 1997.[14,21] The complication rate like Exposure/Extrusion of the Implant was 13.6%, and wound dehiscence was noted in 6% of cases among 30 endophthalmites and 30 panophthalmitis patients.[22]

The successful outcomes of Evisceration with Primary Implants in Fulminant Endophthalmitis/Panophthalmitis were observed in 82.3% of patients, where the success rate was 94.5% in noninfective cases.[23] 72% of oculoplastic surgeons preferred Evisceration versus 28% who preferred enucleation. Among them, 65% would Implant placement during enucleation and 58% would do so during Evisceration. 52% preferred a silicone implant, while 17% preferred hydroxyapatite as a primary implant.[24]

The pain sensation was moderate to severe up to seven days of surgery in infective cases, whereas the pain was moderate up to 4 days of Evisceration with primary implantation. Evisceration with immediate implants showed a pain of 20.8, while Evisceration with delayed implants noticed a pain score of 22.1. In non-infected cases, the pain score was 20.3.[14]

An implant extrusion after primary implantation is a severe complication for surgeons and patients. Our clinical experience shows a connection between Endophthalmitis and a higher chance of Extrusion following the initial implantation. However, research on the risk factors of implant extrusion has been inadequate so far.

In Summary, Evisceration and enucleation with Implantations remain viable treatment options for the cases of Endophthalmitis or Panophthalmitis. Primary implant techniques are simpler, safer, cost-effective, and less painful than delayed implants. Good surgical technique & meticulous postoperative wound care are essential. Post-enucleation pain appears more severe than post-evisceration pain.

5. Ethics Approval

Ethical approval was obtained from the IRB of Sheikh Fazilatunnesa Mujib Eye Hospital and Training Institute in Gopalganj, Bangladesh.

6. Conflict of Interest

The authors state that they have no conflicting interests about the publication of this article.

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References

1. Forrester JV, Dick A, Mcmenamin PG, Roberts F, Pearlman E. Pathology. In: Forrester JV, Dick AD, McMenamin PG, Roberts F, Pearlman E, editors. The Eye (Fourth Edition). W.B. Saunders; 2016. p. 486–538. doi:10.1016/B978-0-7020-5554-6.00009-5.
2. Drancourt M, Whitby M. Endophthalmitis. In: Cohen J, Opal SM, Powderly WG, editors. Infectious Diseases (Third Edition). Mosby; 2010. p. 185–91. doi:10.1016/B978-0-323-04579-7.00016-2.
3. Castellanos MJ, Peters JR, Peak DA, Semple J, Egan D. Endophthalmitis. Medscape; 2023. [Updated June 19]. Available from: https://emedicine.medscape.com/article/799431-overview?form=fpf.
4. Sadiq MA, Hassan M, Agarwal A, Sarwar S, Toufeeq S, Soliman MK, et al. Endogenous endophthalmitis: diagnosis, management, and prognosis. *J Ophthal Inflamm Infect*. 2015;5:32. doi:10.1186/s12348-015-0063-y.
5. Hui JI. Outcomes of orbital implants after evisceration and enucleation in patients with endophthalmitis. *Curr Opin Ophthalmol*. 2010;21(5):375–9. doi:10.1097/ICU.0b013e32833b7a56.
6. O'Donnell B, Kersten R, Mcnab A, Rose G, Rosser P. Enucleation versus evisceration. *Clin Exp Ophthalmol*. 2005;33(1):5–9.
7. Chen KJ, Chen YP, Chao AN, Wang NK, Wu WC, Lai CC, et al. Prevention of Evisceration or Enucleation in Endogenous Bacterial Panophthalmitis with No Light Perception and Scleral Abscess. *PLoS One*. 2017;12(1):28056067. doi:10.1371/journal.pone.0169603.
8. Chee SP, Jap A. Endogenous endophthalmitis. *Curr Opin Ophthalmol*. 2021;12(6):464–70. doi:10.1097/00055735-200112000-00012.
9. Shrader SK, Band JD, Lauter CB, Murphy P. The clinical spectrum of endophthalmitis: incidence, predisposing factors, and features influencing outcome. *J Infect Dis*. 1990;162(1):115–20.
10. Krause L, Bechrakis NE, Heimann H, Kildal D, Foerster MH. Incidence and outcome of endophthalmitis over a 13-year period. *Can J Ophthalmol*. 2009;44(1):88–94.
11. Ramakrishnan R, Bharathi MJ, Shivkumar C, Mittal S, Meenakshi R, Khadeer MA, et al. Microbiological profile of culture-proven cases of exogenous and endogenous endophthalmitis: a 10-year retrospective study. *Eye (Lond)*. 2009;23(4):945–56.
12. Ozgur OR, Akcay L, Dogan OK. Primary implant placement with evisceration in patients with endophthalmitis. *Am J Ophthalmol*. 2007;143(5):902–4. doi:10.1016/j.ajo.2006.11.029.
13. Smith TS, Koornneef L, Mourits MP, Groet E, Otto AJ. Primary versus secondary intraorbital implants. *Ophthal Plast Reconstr Surg*. 1990;6(2):115–8.
14. Liu D. Compare implant extrusion rates and postoperative pain after evisceration with immediate or delayed implants and after enucleation with implants. *Trans Am Ophthalmol Soc*. 2005;103:568–91.
15. Pariseau B, Fox B, Dutton JJ. Prophylactic Antibiotics for Enucleation and Evisceration: A Retrospective Study and Systematic Literature Review. *Ophthalmic Plast Reconstr Surg*. 2018;34(1):49–54.
16. Liu D. Evisceration techniques and implant extrusion rates: A retrospective review of two series and a survey of ASOPRS surgeons. *Ophthalmic Plast Reconstr Surg*. 2007;23(1):16–21. doi:10.1097/01.iop.0000249430.33159.f3.
17. Abel AD, Meyer DR. Enucleation with primary implant insertion for treatment of recalcitrant endophthalmitis and panophthalmitis. *Ophthalmic Plast Reconstr Surg*. 2005;21(3):220–6. doi:10.1097/01.iop.0000159174.80985.e2.
18. Tawfik HA, Budin H. Evisceration with primary implant placement in patients with endophthalmitis. *Ophthalmology*. 2007;114(6):1100–3. doi:10.1016/j.ophtha.2006.09.027.
19. Dresner SC, Karesh JW. Primary implant placement with evisceration in patients with endophthalmitis. *Ophthalmology*. 2000;107(9):1661–4.
20. Park YG, Paik JS, Yang SW. The results of evisceration with primary porous implant placement in patients with endophthalmitis. *Korean J Ophthalmol*. 2010;24(5):279–83. doi:10.3341/kjo.2010.24.5.279.
21. Valeshabad A, Naseripour M, Asghari R, Parhizgar SH, Parhizgar SE, Taghvaei M, et al. Enucleation, and evisceration: indications, complications and clinicopathological correlations. *Int J Ophthalmol*. 2014;7(4):677–80.
22. Tianthong W, Aryasit O. Outcomes of evisceration or enucleation by resident trainees in patients with recalcitrant endophthalmitis or panophthalmitis. *Medicine (Baltimore)*. 2022;101(30):e29932.

doi:10.1097/MD.0000000000029932.
23. Tripathy D, Rath S. Evisceration with Primary Orbital Implant in Fulminant Endophthalmitis/Panophthalmitis. *Orbit*. 2015;34(5):279–83. doi:10.3109/01676830.2015.1078366.
24. Fu R, Childs J, Nunery W, Timoney P. Surgical preferences in the management of recalcitrant endophthalmitis. *Orbit*. 2018;37(5):315–20. doi:10.1080/01676830.2017.1423340.

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