Postenucleation socket syndrome – clinical manifestations and surgical treatment

Postenukleacijski sindrom – klinični znaki in zdravljenje

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Abstract

Background: Postenucleation socket syndrome (PSS) is a well recognized late complication of the enucleation surgery. The underlying pathophysiology is not well established. The most common causes of PSS are inadequate implant selection and inadequate maintenance of orbital sac. Clinical manifestations of PSS are numerous and treatement is individual, conservative or surgical.

Patients and methods: This article represents our experience in PSS treatment at the Eye Hospital Ljubljana in form of retrospective study of 88 patients treated due to PSS. 60 men and 28 women averaging 37 years were treated in our institution between 1990 and 2005, PSS evolved on average 19.5 years after the enucleation. Causes included shallow anterior fornix in 46.6 %, atrophy of the orbital tissue in 26.0 %, symblepharon in 8.0 %, dehiscence of conjunctiva in 6.8 %, recidivant conjunctivitis in 5.7 %, granuloma and eyelid laxity in 1.1 %. We performed secondary implantation in 38.6 %, deepening of the fornix in 34.1 %, synechiolysis in 20.5 % and other procedures in 6.8 %. In 62 cases (70 %) results were good or excellent and in 24 cases (27 %) additional procedures were required. Criteria of success were good position and mobility of eye prosthesis. All the procedures were performed by the same surgeon who also evaluated clinical results. Patients were monitored daily first 7 to 10 days. 6–8 weeks after the final procedure prosthesis was inserted.

Conclusions: Clinical manifestations of PSS are various, so the treatment is individual. Additional surgical procedures are often required to achieve the best possible functional and esthetic result.

Izvleček

Izhodišča: Postenukleacijski sindrom (PSS) je dobro znan pozni zaplet, ki nastane po odstranitvi zrkla (enukleaciji). Točen mehanizem, ki ga sproži, še ni dobro poznan.

Najpogostejši vzroki PSS so nepravilna izbira tipa in velikosti vsadka ter neustrezna higiena očesne vrečke po enukleaciji. PSS se lahko kaže z različnimi kliničnimi znaki, temu pa je prilagojeno tudi zdravljenje, ki je lahko konzervativno ali kirurško.

Bolniki in metode: S PSS se srečujemo tudi na Očesni kliniki v Ljubljani. V članku so predstavljene naše izkušnje s prepoznavanjem in zdravljenjem PSS v obliki retrospektivne študije. Študija je zajela 88 pacientov, 60 moških in 28 žensk, ki so bili zdravljeni v naši ustanovi zaradi PSS med leti 1990 in 2005. PSS se je razvil v povprečju 19,5 let po enukleaciji. Vzroki so vključevali splitven sprednji forniks v 46,6 %, atrofijo orbitalnega tkiva v 26,0 %, simblefaron v 8,0 %, dehiscenco veznice v 6,8 %, recidivantni konjunktivitis v 5,7 %, granulom in ohlapnost vek v 1,1 %. V 38,6 % smo opravili sekundarno implantacijo orbitalnega vsadka, v 34,1 % poglobitev sprednjega forniksa, v 20,5 % sinehiolizo, ostale posege pa v 6,8 %. V 62 primerih (70 %) so bili rezultati po enem posegu dobri ali odlični, v 24 primerih (27 %) pa so bili potrebni dodatni posegi. Kriteriji uspeha so bili dobra lega in mobilnost očesne proteze. Vse posege je opravil isti operater, ki je tudi ocenil rezultate. Pacienti so bili prvih 7 do 10 dni nadzorovani dnevno, po 6 do 8 tednih je bila vstavljena očesna proteza.

Zaključki: PSS se lahko kaže z različnimi kliničnimi znaki, pristop k zdravljenju je individualen, večkrat je potrebno več operativnih posegov, da bi zagotovili čimbolj funkcionalen in estetski rezultat.

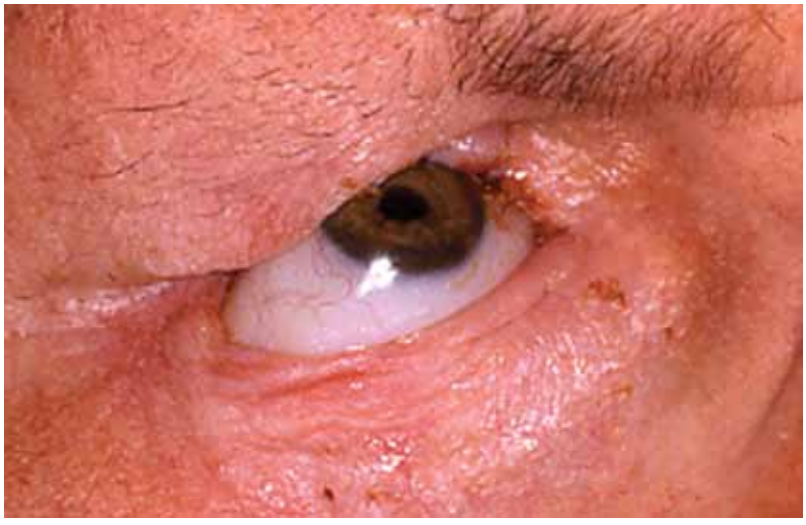
Figure 1: Atrophy of orbital tissue with recidivant conjunctivitis and symblepharon.

Introduction

Enucleation is surgical procedure where the eye is removed and the optic nerve is dissected. The primary goal of enucleation is treatment (removal of malignoma, pain facilitation, etc.). Secondary, as important, goals are achieving best possible functional and esthetic results, that are presented with good motility and symmetry of the prosthesis.[1]

The most common late enucleation complication is postenucleation socket syndrome (PSS). The underlying pathophysiology is not well established but two most common causes are inadequate hygiene of orbital sac and inadequate implant type and size selection.[1] Inadequate hygiene leads to chronic conjunctivitis and atrophy of orbital tissue, which causes changed position of prosthesis (Figure 3) and accelerates additional orbital tissue damage.[1,5]

Figure 2: Left shallow anterior fornix with prosthesis extrusion.



Clinical manifestations of PSS are numerous and include shallow anterior fornix, atrophy of orbital tissue (Figure 1), symblepharon, dehiscence of conjunctiva, recidivant conjunctivitis (Figure 2), granuloma, eyelid laxity, ptosis, entropion or ectropion of lower lid. Finally they result in orbital depression, orbital aperture reduction, prosthesis dislocation (Figure 3) or troubled prosthesis insertion. When extensive damage of orbital bone structure is present bigger dislocation of orbital contens can occur and results in facial deformation.[1,2,3,5]

Because clinical manifestations of PSS are so various the treatment is individual. It includes conservative and surgical procedures.

Conservative treatment of PSS is simple, noninvasive and appropriate for simple cases. It includes conjunctivitis and granuloma treatment topically. Sometimes appearance can be improved with prosthesis enlargement (if status of fornicis allows) or with use of »phanthom glasses« where magnifying glass is inserted in front of the prosthesis. This magnifies damaged side and approximates it to the healthy eye.

The goal of surgical treatment is to increase orbital volume, to enable wearing the eye prosthesis and to achieve the best possible functional and esthetic result.[1] Each patient demands individual treatment according to severity of the problems. Simple procedures include synechiolysis, deepening of the fornix, fat tissue implantation, resection of lateral ligament and reconstruction of the lid.

When bigger orbital defect is present secondary implantation is necessary. In most severe orbital deformations, where orbital wall is affected, interdisciplinary approach includes ophthalmologist, othorhynolaryngologist and maxillofacial surgeon and bone parts are reconstructed first.

When several reconstructions are not efficient use of epithesys is in place to achieve facial symmetry (Figure 4).

In PSS surgery numerous autologue, homologue and aloplastic materials are used. Autologue materials include oral mucosa for

Figure 3: Dehiscence of the conjunctiva with implant protrusion.

fornix reconstruction, fascia lata for ptosis procedure or lower lid stabilisation, musculocutaneus transplantat for volume deficit, parts of crista iliaca anterior superior or rib for orbital wall reconstruction, etc.

Homologue materials are lyodura, sclera from the scleral bank, irradiated bone or cartilage, etc. Most often used aloplastic materials are silicone, hydroxyapathite, PTFA (polytetrafluorethylene) and titanium.[1,4]

Orbital implants

In 1885 the first implantation was performed when Mules implanted glass ball in the orbita after the evisceration. Later numerous materials were used. Presently the most frequently integrated hydroxyapathite (HA) implants are used. HA implants are porous and allow excellent fibrovascular ingrowth with good antiinflammatory effect. They also have very low extrusion rate and allow good prosthesis position. Implant becomes a part of the orbita. If possible we use wrapping implant with autologue sclera (Figure 5) to achieve better muscle attachement shorter recovery.[2,4,6] Contraindication for HA implant use include orbital malignoma, orbital inflammations or postradiation PSS.[1,2,7]

Recently in cases of congenital anophthalmus or for enlargement of very constricted anophthalmic socket orbital tissue expanders are used. They are placedin their dry, constricted state and expand gradually via osmosis. Long term results are not yet known but early studies are promising.

When we use orbital implant choosing right size is also very important. We select according to the size of the healthy eye, type of orbita (deep, shallow), implantation technique (implantation type, use of sclera wrapping, muscle positioning) and quantity of orbital tissue. Every procedure results in some rate of tissue atrophy so we always use bigger implant than intraoperatively measured.[2,7] Implant can replace 2–4 ml of orbital volume and the prosthesis additional 1–2 ml.[1]

Patients and methods

Objective

Our retrospective study presents clinical manifestations and results of the surgical treatment of PSS at the University Eye Clinic in Ljubljana.

Methods

Retrospective study of 88 patients treated at the University Eye Clinic in Ljubljana 60 men and 28 women averaging 37 years (range 1 to 73 years) were treated at our institution between 1990 and 2005 due to PSS. This condition evolved on the average 19.5 years after enucleation (range 3 months to 57 years). The cause of the PSS were shallow anterior fornix in 41 patients (46.6 %), atrophy of the orbital tissue in 23 patients (26.0 %), symblepharon in 7 patients (8.0 %), dehiscence of conjunctiva in 6 cases (6.8 %), recidivant conjunctivitis in 5 patients (5.7 %), granuloma and eyelid laxity in 1 patient (1.1 %). We performed the following procedures: secondary implantation in 34 cases, deepening of the fornix in 30 cases, synechiolysis in 18 cases and other surgical procedures in 6 cases.

Results

Between 1990 and 2005 we operated 88 patients due to PSS, on the average 19.5 years after enucleation. In 62 cases (70 %) results were good or excellent after a single procedure. In 24 cases (27 %) additional procedures were needed. The following procedures were performed to treat these patients: fornix reconstruction in 9 cases, explanta-

Figure 4: Use of epithesis to achieve the best cosmetic result.

tion with secondary implantation in 5 cases and other procedures in 10 cases. The success rate of our treatment was almost 90 %. Patients were monitored daily first 7 to 10 days. 6–8 weeks after the final procedure eye prosthesis was inserted. Regular appointment with the oculoplastic surgeon was 1 month after inserted prosthesis, following every 5 years or in the case of problems. All the procedures were performed by the same surgeon who also evaluated clinical results. Criteria of success were good position and mobility of eye prosthesis. Evaluation is partially subjective and conditioned by surgeons clinical experience, which is the case in other European ophthalmic centres.

Discussion and conclusions

According to literature, PSS is a relatively frequent complication (13–25 %) after enucleation. There is no "the best" method or protocole for monitoring or treating patients. PSS can manifest with numerous clinical signs, so treatment is individual and multilevel. The goal of PSS treatment is to achieve the best possible functional and esthetic result. This way is possible for the patient to achieve fast rehabilitation with custom made prosthesis.

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Figure 5: Use of epithesis to achieve the best cosmetic result.