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Results of subconjunctival 5-fluorouracil in the management of bleb failure: A case series

Bleb yetersizliğinin tedavisinde subkonjonktival 5-fluorourasil kullanımının sonuçları: Olgu serisi

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Abstract

Aim: To evaluate the efficacy of 5-Fluorouracil (5-FU) injections in eyes with bleb failure and uncontrolled intraocular pressure (IOP) after trabeculectomy.

Materials and Methods: Fifteen eyes of 15 patients (6 female, 9 male) were included in this retrospective study. All patients had trabeculectomy surgery for the treatment of primary open angle glaucoma. During the first year follow-ups, cases with IOP higher than 21 mmHg and ineffective blebs were considered as bleb failure. We used 5-FU subconjunctival injections, in the same concentration (5 mg) but in different numbers, to treat the bleb failure and lower the IOP. The efficacy of the treatment was evaluated.

Results: The mean age was 59.3±12.4 years (range 43-74 years). The mean 5-FU injection count was 5.27±1.58 injections (range 2-7). The mean IOP was reduced to 17.07±7.10 mmHg after treatment. There was a statistically significant difference in IOP levels before and after the injections ($p<0.05$).

Conclusion: 5-FU injection treatment is safe and effective for the treatment of bleb failure after trabeculectomy.

Keywords: Trabeculectomy, bleb failure, 5-FU, 5-fluorouracil.

Öz

Amaç: *Trabekülektomi sonrasında bleb yetersizliği ve göz içi basınç (GİB) yüksekliği olan gözlerde 5-Fluorouracil (5-FU) enjeksiyonlarının etkinliğini değerlendirmek.*

Gereç ve Yöntem: *Retrospektif çalışmaya 15 hastanın 15 gözü (6 kadın, 9 erkek) dahil edildi. Tüm hastalar daha önce açık açılı glokom nedeniyle trabekülektomi olmuştu. Birinci yıl takipleri sırasında, GİB'ının 21 mmHg'den yüksek olması ve inefektif bleb varlığı bleb yetersizliği olarak değerlendirildi. Bleb yetersizliğini tedavi etmek ve GİB'ını düşürmek için bu hastalara aynı dozda (5 mg) fakat farklı sayılarda subkonjonktival 5-FU enjeksiyonları uygulandı. Tedavi etkinliği değerlendirildi.*

Bulgular: *Ortalama yaş 59.3±12.4 (43-74 aralığında) idi. Ortalama 5-FU enjeksiyon sayısı 5.27±1.58 (2-7 aralığında) idi. Ortalama GİB tedaviyle 17.07±7.10 mmHg'ya düştü. Enjeksiyonlar öncesi ve sonrası dönem arasında GİB seviyelerinde istatistiksel olarak anlamlı düşüş tespit edildi ($p<0.05$).*

Sonuç: *5-FU enjeksiyon tedavisi, trabekülektomi sonrası bleb yetmezliği olan vakalarda güvenli ve efektiftir.*

Anahtar Sözcükler: *Trabekülektomi, bleb yetersizliği, 5-FU, 5-fluorourasil.*

Introduction

Glaucoma is a progressive optic neuropathy that may cause irreversible visual field defects (1). Intraocular pressure (IOP) is a major risk factor for the development and progression of the disease (2). Lowering and controlling the IOP is the primary goal of treatment (2). There are three main treatments for glaucoma; medical, laser and surgical. Usually the medical treatment is the first option. Surgical treatment is the next step after medical treatment failure. Trabeculectomy is still the gold standard surgery for glaucoma (2). In Trabeculectomy a fistula is created between the anterior chamber and the subconjunctival space and a bleb is formed. During the follow-ups postoperative inflammation and scar formation may lead to bleb failure. Antimetabolites may be used postoperatively for further reduction of subconjunctival fibrosis. Mitomycin-C (MMC) and 5-fluorouracil (5-FU) are the most commonly used antimetabolites in glaucoma practice. MMC and 5-FU are typically used in eyes at high risk for bleb failure but using different

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protocols and dosages. Because of their nonspecific effect on cell biology, the application can lead to cell damage followed by bleb leakage and hypotony even in serious cases it may lead corneal scarring and endophthalmitis. Postoperative subconjunctival injections of 5-FU may retard bleb fibrosis and enhance filtration (3).

The purpose of this study was to evaluate the efficacy of 5-FU in eyes with bleb failure and uncontrolled IOP after trabeculectomy.

Materials and Methods

Fifteen eyes of 15 patients (6 female, 9 male) were included this retrospective study. We evaluated 67 patients' files that underwent trabeculectomy in last two years. All patients had trabeculectomy surgery for treatment of primary open angle glaucoma. All surgeries were done by the same surgeon in same fashion. Patients visits was planned at day 1, day 3, day 10 and then monthly after surgery. IOP was measured with Goldmann applanation tonometer at all patients visit and bleb examination was done with slit lamp. During the 1 year follow-ups 15 of the cases had bleb failure and high intraocular pressure after trabeculectomy. IOP over than 21 mmHg and ineffective blebs regarded as a bleb failure. After written informed consent was given and signed, the 5-Fluorouracil (5-FU) was administered. We used 5-Fluorouracil (5-FU) subconjunctival injections, in same concentration 5 mg but different counts, to treat the bleb failure and lowering the IOP. All injections were administered in surgery room by the same surgeon under local anesthesia. Injection site was 180 degrees away from the bleb in all cases.

After the 5FU treatments, IOP under 18 mmHg was considered as successful result, controlled IOP with one eye drop (one antiglaucomatous agent) was considered as partially successful results and controlled IOP with two or more drops or uncontrolled IOP was considered as failure.

The data was analyzed in SPSS version 20.0 (SPSS Inc. Chicago, IL, USA). Paired t-test was used for statistical analysis and p value of less than 0.05 was considered to be statistically significant.

Results

The mean age was 59.3±12.4 years (range 43-74 years). The mean time of bleb failure occurrence was at 32.6±20.9 days (range 21-62 days) after the surgery. The mean 5 mg 5-FU injection count was 5.27±1.58 injections (range 2-7).

The mean IOP reduced to 17.07±7.10 mmHg after 5-FU injections. There was statistically significant difference in IOP levels before and after the injections ($p<0.05$). The treatments were successful in %33 of cases, partially successful in %60 of cases and failed in %7 of cases.

Discussion

To avoid the progression of glaucomateous visual field defects, the reduction of intraocular pressure is the aim of the treatment for all glaucoma patients (2). Medical treatment usually is the first step of the treatment. Surgical treatment is the next step after initial medical treatment failure. Trabeculectomy is the gold standard surgery (4). In this procedure, after dissecting a partial thickness scleral flap, a fistula is created between the anterior chamber and the subconjunctival space, and a bleb is formed under the conjunctiva and Tenon's Capsule. With using of steroids and anti-fibrotic agents have been suggested to maintain the patency of the bleb; however, this goal is not always achieved. Postoperative inflammation and scar formation may lead to bleb failure (5). Antimetabolites may be used postoperatively for further reduction of subconjunctival fibrosis, which is especially important in eyes at high risk of failure. Postoperative subconjunctival injections of 5-FU may retard bleb fibrosis and enhance filtration (6, 7).

In this study we found that 5-FU injections just failed in %6.6 of all cases. Some previous studies present similar successful results (8,9). Tatham et al. (8) reported that 5-FU is an effective technique for trabeculectomy bleb remodeling and can result in a sustained reduction in IOP. Rashad (9) reported that a significant reduction of mean IOP from 36.91 mmHg to 14.73 mmHg is achieved at the final follow-up and the overall success rate was 92%. He added that repeated needling with adjunctive 5-FU proved a highly effective in managing bleb failure (9). Wong et al. (10) reported that the 8-year outcomes of Asian subjects who underwent trabeculectomy augmented by intraoperative 5-fluorouracil (5-FU) or placebo and they found that there was no significant difference in IOP between the 5-FU and the placebo group at 8 years. This report showed us there is no need for using 5-FU intraoperatively. However our study and some previous studies showed that 5-FU is effective in the treatment of bleb failure after trabeculectomy.

Conclusion

5-FU injection treatment is safe and effective for treatment of bleb failure after trabeculectomy.

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