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Combined therapy for epistaxis by hereditary hemorrhagic telangiectasia: A 3-year follow up study on 45 patients[☆]



Giorgos Papaspyrou^{*}, Dietmar Hecker, Maximilian Linxweiler, Bernhard Schick, Basel Al Kadah

Department of Otorhinolaryngology, (Head: Prof. B. Schick, MD), University Medical Centre Homburg/Saar, Kirrberg Straße, 66421, Homburg/Saar, Germany

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ABSTRACT

Hereditary hemorrhagic telangiectasia (HHT) is a mutilating disease associated with the majority of patients with recurrent epistaxis episodes. The aim of this study was to present a single institution experience with patients treated for nasal epistaxis using a combination of Nd:YAG laser and argon plasma coagulation (APC) vs Nd:YAG laser alone, with a minimum follow-up of 3 years.

45 patients (21 men, 24 women) aged from 15 to 84 years with the diagnosis of HHT were treated in the Department of Otorhinolaryngology, Head and Neck Surgery in Homburg/Saar between 10/2002 and 10/2012 because of epistaxis, using a combination of Nd:YAG laser and APC or Nd:YAG laser alone. The observation period ranged from 36 to 120 months.

15 patients were treated with Nd:YAG laser alone and 30 patients with combined Nd:YAG laser and APC. A revision was necessary in three patients (20%) in the Nd:YAG laser group and in nine (33.3%) patients in the combined group. The difference between revision rates after the two therapy forms was not statistically significant ($p = 0.492$). Bipolar coagulation was additionally applied in 33 patients. There was no statistically significant difference ($p = 1.00$) in revision rates between patients who were additionally treated with bipolar coagulation and those who did not receive bipolar coagulation as part of their treatment. No case of postoperative septal perforation was observed.

Nd:YAG laser therapy remains an established option for treating treat epistaxis in HHT patients.

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1. Introduction

Hereditary hemorrhagic telangiectasia (HHT) is an autosomal dominant inherited disease of the fibrovascular tissue (Geisthoff et al., 2002; Al Kadah et al., 2015). The most common symptom in approximately 90% of patients with HHT is epistaxis (Al Kadah et al., 2015; Bergler et al., 1998). The underlying abnormality leading to recurrent nasal bleeding in these patients is a weakened vascular wall (Hanes, 1907; Lennox et al., 1997; Bergler et al., 1997; Brooker and Cinnamond, 1991). The clinical manifestation is age-dependent and complete at the age of 45, but primary

manifestations after the age of 65 years have also been reported (Haitjema et al., 1996; Byahatti et al., 1997). The following diagnostic criteria (Curacao criteria) were proposed in 2000 by the Scientific Advisory Board of the HHT Foundation International for patients with HHT: epistaxis, telangiectasias, visceral lesions, and positive family history (Shovlin et al., 2000; Cerra Pohl et al., 2008). Diagnosis of HHT is confirmed by the presence of three criteria, possible by the presence of two criteria, and unlikely when fewer than two criteria are met.

A plethora of therapeutic modalities – surgical and conservative – have been introduced, like surgical closure of the nostrils (Young, 1967; Brooker and Cinnamond, 1991; Gluckman and Portugal, 1994; Lund and Howard, 1997; Farin and Grund, 1994; Fiorella et al., 2005; Folz et al., 2008, 2013), septodermoplasty (Saunders, 1960; Fiorella et al., 2005; Geisthoff et al., 2002; Ghaheri et al., 2006), vascular embolisation (Strother and Newton, 1976; Weissman et al., 1995; Gieriek and Paluch, 2000; Gluckman and

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^{*} Corresponding author. Department of Otorhinolaryngology, University of Homburg, Kirrberg Straße, 66421, Homburg/Saar, Germany. Fax: +49 6841 1622997.

E-mail address: g1981papaspyrou@gmail.com (G. Papaspyrou).

Portugal, 1994), hormone-therapy (Vase, 1981; Harrison, 1982; Grund et al., 1997; Haitjema et al., 1996), argon plasma coagulation (APC) (Farin and Grund, 1994; Bergler et al., 1997, 1998; Grund et al., 1997; Gierek and Paluch, 2000; Sadick et al., 2003; Hanes, 1907; Harries et al., 1997; Harrison, 1982; Harvey et al., 2008; Janda et al., 2002; Karapantzos et al., 2005), different types of laser surgery (Lenz and Eichler, 1984; Shapsay and Oliver, 1984; Parkin and Dixon, 1985; Kardos et al., 1989; Lippert and Werner, 1996; Vickery and Kuhn, 1996; Byahatti et al., 1997; Harries et al., 1997; Lippert and Werner, 1997; Werner et al., 1997; Janda et al., 2002; Shah et al., 2002; Karapantzos et al., 2005; Kühnel et al., 2005; Harvey et al., 2008; Kardos et al., 1989; Kühnel et al., 2005; Lennox et al., 1997; Lenz and Eichler, 1984; Lippert and Werner, 1996, 1997; Lund and Howard, 1997; Meredith, 1988; Parkin and Dixon, 1985; Sadick et al., 2003; Saunders, 1960; Shah et al., 2002; Shapsay and Oliver, 1984; Shovlin et al., 2000; Strother and Newton, 1976) and, more recently, closing of the nostrils by means of silicone nasal olives (Al Kadah et al., 2015; Bergler et al., 1998) or breathing tubes (Folz et al., 2013; Vase, 1981), mainly to reduce the amount and frequency of epistaxis episodes in these patients. Since most of the above mentioned techniques cannot lead to permanent bleeding cessation, a regular application of nasal ointments is usually necessary, and can be an efficient method for the initial treatment (Folz et al., 2008; Vickery and Kuhn, 1996). The application of such an ointment is essential regardless of any additional chosen therapy (Al Kadah et al., 2015; Bergler et al., 1998).

The aim of this study was to examine the role and efficacy of the combination of Nd:YAG laser and APC in the treatment of epistaxis in HHT patients in comparison with the established therapy of Nd:YAG laser as monotherapy. This is, according to our knowledge, the first study examining the combination of these two modalities in patients with HHT.

2. Materials and methods

Between 10/2002 and 10/2012, 45 consecutive patients with HHT were treated with either a combination of Nd:YAG laser and APC or with Nd:YAG as a monotherapy in the Department of Otolaryngology, Head and Neck Surgery in Homburg/Germany. Endpoints analyzed included age, gender, operation time, interval between surgical sessions, number of surgical sessions, and complications. Patients who had received previous surgical treatment, patients with septal perforations or synechias, and patients with nasal polyps were excluded from our analysis. In this study were included only patients who had, during their follow up, in cases of necessary revision, the same type of therapy (of the patients who were initially treated with combined Nd:YAG laser and APC therapy, only those who had the same therapeutic modality – Nd:YAG laser combined with APC – during follow-up, and patients initially treated with Nd:YAG laser alone who were treated during follow-up only with Nd:YAG laser). This important parameter was applied to achieve a more unbiased analysis. Patients who also received, postoperatively, special types of nasal ointment, such as Stammberger dressing or carboxylmethylcellulose sponges, were also excluded. Follow-up ranged from 36 to 120 months (mean 78 months). Statistical analysis was performed with the aid of the Fischer's exact test, the Kolmogorov–Smirnov test, the Levene test and the *t* test. The study was reviewed by the ethics committee of the state of Saarland (Homburg, Germany), protocol Nr. 269/16. In this study, we followed the guidelines of the Helsinki Declaration.

2.1. Surgical Technique

All procedures were performed under general anesthesia. Throughout the procedures a rigid nasal endoscope (0° optic, OD 4 mm; Karl Storz, Tuttlingen, Germany) connected to a video device was used (Fig. 1). Cotton pledgets soaked in 10% xylocaine and 0.05% oxymetazoline HCl were applied in both nasal passages for 10 min to achieve vasoconstriction and topical anesthesia before starting treatment.

For the combined treatment, Nd:YAG laser was initially used to treat the telangiectatic lesions. The laser was applied using a centripetal technique – from the periphery to the centre of the angiodysplastic lesions. Power of 15–25 W, with an activation time of 0.1–0.5 s, was used. The distance between the laser fiber and the treated mucosa ranged from 2 mm to 5 mm. The Nd:YAG laser treatment was not performed on both septal sides simultaneously to avoid septal perforation. In cases of venous bleeding the APC probe was used in non-contact mode till paling and shrinkage of these lesions was achieved. Power of 20 W, with an activation time of 1–3 s, was used.

In cases of therapy with Nd:YAG laser alone, the above-mentioned technique was used. In some cases, APC or Nd:YAG laser alone led to more bleeding from the nasal lesion during the operation, which could not be controlled through the use of Nd:YAG laser or APC alone, so bipolar coagulation was also applied, using a power of 8–10 W.

Nasal ointment was applied pre- and also postoperatively. No nasal packing was necessary after completion of the operation.

3. Results

There were 21 male (46.6 %) and 24 female (53.4 %) patients. Ages ranged from 15 to 84 years, with a mean age of 49.5 years and

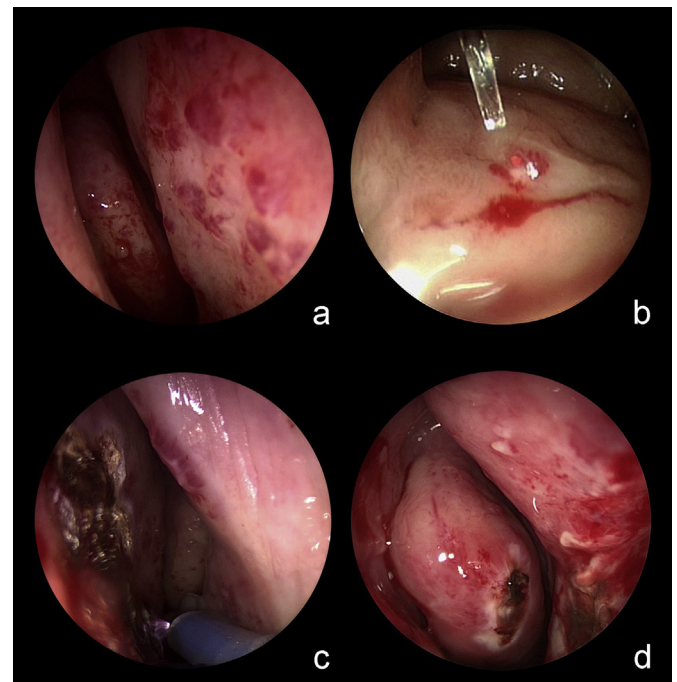


Fig. 1. a. Endoscopic view of telangiectatic lesions. b. Coagulation of the lesions with Nd:YAG laser. c. Coagulation of the lesions with APC. d. Endoscopic result after combined therapy with APC and Nd:YAG laser.

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