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【应用研究】

532 nm 激光光凝治疗视网膜前出血的临床观察

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Clinical observation of 532 nm laser photocoagulation for pre-retinal hemorrhage

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【Key words】 pre-retinal hemorrhage; laser photocoagulation; diabetic retinopathy

【Abstract】 **Objective** To explore the clinical efficacy of 532 nm laser photocoagulation for pre-retinal hemorrhage. **Methods** Thirteen patients (13 eyes) with pre-retinal hemorrhage in our hospital from January 2010 to October 2013 were collected and the clinical data were retrospectively analyzed. All 13 eyes were treated by 532 nm laser photocoagulation, in which 8 eyes underwent the laser photocoagulation treatment of pre-retinal hemorrhage after the laser incision and drainage of the posterior vitreous cortex had failed, 5 eyes with the treatment duration of over 2 weeks directly underwent the laser photocoagulation treatment. All the patients went through the retinal laser photocoagulation once or twice, the follow-up time was 1 month, the visions, fundus photographs and complications were observed. **Results** Of all the 13 eyes treated by laser, 6 eyes (46. 2%) undergone the retinal laser photocoagulation once and 7 eyes (53. 8%) twice. After the treatment the pre-retinal hemorrhage significantly absorbed and the average time of absorbing was 18. 92 days. The vision of all cases improved to varying degrees, the average vision at postoperative 1 month improved by 6. 0 lines. No photocoagulation spots were left and no pigment proliferation appeared on the laser mark after pre-retinal hemorrhage absorbing. No obvious laser complication was observed in all cases. **Conclusion** 532 nm laser photocoagulation for pre-retinal hemorrhage is simple, practical, safe and effective, and can be operated repeatedly. It can be used as an effective method after the failure of the laser incision and drainage of the posterior vitreous cortex or in the context of a relatively long duration.

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【关键词】 视网膜前出血;激光光凝术;糖尿病视网膜病变

【摘要】 **目的** 探讨532 nm激光光凝治疗视网膜前出血的临床疗效。**方法** 收集我院2010年1月至2013年10月确诊为视网膜前出血的患者13例(13眼),对其临床资料进行回顾性分析。8眼行激光爆破模式引流失败,改行激光光凝模式治疗;5眼视网膜前出血病程超过2周者直接行激光光凝模式治疗。所有患者均接受视网膜激光光凝模式治疗1~2次,术后随访1个月,观察视力、眼底彩照及并发症情况。**结果** 接受激光治疗的13眼患者,6眼(46. 2%)行1次视网膜激光光凝术、7眼(53. 8%)行2次视网膜激光光凝术。所有病例经治疗后出血均明显吸收,平均吸收时间18. 92 d;视力都有不同程度提高,1个月随访视力平均提高6. 0行。视网膜前出血吸收后激光光凝处未遗留激光斑痕迹,亦无色素增生,所有病例无其他激光并发症发生。**结论** 532 nm激光光凝模式治疗视网膜前出血简单实用、安全有效,且可重复实施,在激光引流视网膜前出血失败后或对于病程较长者可作为有效治疗手段。

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视网膜前出血多数位于黄斑区,严重影响患者视力,它的治疗方法目前主要有保守药物治疗、激光治疗以及玻璃体切割术。保守治疗病程较长,增加了血液对视网膜的毒性刺激作用,而玻璃体切割术属于相对较复杂的内眼手术,患者既要承受较重的经济负担还要承担较大的手术风险,激光治疗相对简单、经济,且可重复实施,患者易于接受。近年国内外报道较多的激光方法是激光玻璃体后皮质切开引流术,即将视网膜前出血引流至玻璃体,使患者视力迅速提高^[1],但这种激光方法对于出血时间较长

或出血不规则的病例较难奏效。我们利用激光的热效应,尝试对视网膜前出血激光引流失败的病例或病程较长的病例进行常规视网膜激光光凝,以促进出血吸收、缩短病程,收到良好疗效,现报告如下。

1 资料与方法

1.1 一般资料 收集2010年1月至2013年10月在我科接受532 nm半导体固体激光光凝治疗的视网膜前出血患者13例13眼的临床资料,其中男8例8眼,女5例5眼;年龄22~65岁,平均36.2

岁。右7眼,左6眼;视力为眼前数指~0.2;病程为3~35 d,平均14 d;出血范围为2~8 PD。出血呈舟状者10眼,其中1眼有眼外伤史,6眼考虑Valsalva视网膜病变,2眼合并视网膜大动脉瘤,1眼合并有增生性糖尿病视网膜病变(proliferative diabetic retinopathy, PDR);出血呈不规则形3眼,均为合并PDR者。

1.2 方法 所有患者的激光治疗均在同一台532 nm 固体激光仪(日本NIDEK, GYC-1000)上进行,术前充分散大瞳孔,丙美卡因滴眼液表面麻醉2~3次。激光方法为:(1)激光爆破模式:利用532 nm 固体激光的爆破效应,对准黄斑部出血灶颞下缘并尽量远离黄斑中心的部位发射激光,切开玻璃体后皮质,其中光斑直径为50~80 μm,时间0.04~0.06 s,能量700~1000 mW,发射次数3~8次;(2)激光光凝模式:直接对准视网膜前出血区域光凝,避开黄斑中心,光斑之间紧邻不留间隔,光斑直径为100~200 μm,时间0.10~0.20 s,能量180~250 mW。1周后根据视网膜下出血吸收情况可重复行激光光凝治疗。

视网膜前出血病程少于2周者,先行激光爆破模式切开玻璃体后皮质进行引流;视网膜前出血病程超过2周者直接行激光光凝模式治疗。若合并PDR者,先完成全视网膜激光光凝,再行视网膜前出血激光光凝模式治疗,否则可能出现严重玻璃体积血导致治疗无法进行;合并视网膜大动脉瘤者,先行视网膜前出血激光光凝模式治疗,待视网膜前出血吸收暴露瘤体后再行瘤体激光光凝治疗。同时应用复方血栓通胶囊等药物促进出血吸收。

1.3 观察项目 所有患者治疗前均接受了视力、裂隙灯、眼底彩照及眼底荧光血管造影(FFA)检查。术后随访1个月,观察视力、眼底彩照等,以观察疗效。

2 结果

2.1 治疗前后一般状况 13眼患者中8眼激光爆破模式引流失败后,术中即用同一台仪器改行激光光凝模式治疗;另5眼直接采用激光光凝模式治疗。视网膜前出血行激光光凝后光斑呈红白色,范围为覆盖除黄斑中心外的其他视网膜前出血区域。首次激光光凝模式治疗视网膜前出血1周后出血明显吸收仅需一次治疗者6眼(46.2%),出血均为舟状,平均病程8.5 d。部分患者治疗第2天出血便明显吸收,黄白色硬性渗出析出,部分激光斑也已吸收,出血吸收较快的病例多数病程较短,且未合并其他视网膜病变。首次激光光凝模式治疗1周后观察到出血吸收欠佳需重复行激光光凝模式治疗者7眼(53.8%),平均病程19.0 d。7眼中4眼出血呈舟状,其中1眼为外伤引起出血范围较大(约8 PD),1眼合并糖尿病视网膜病变,1眼合并大动脉瘤,1眼

为Valsalva视网膜病变,病程分别为9 d、16 d、18 d、35 d;3眼出血呈条带状或不规则形,均合并糖尿病视网膜病变。故病程较长或合并糖尿病视网膜病变者出血相对难以吸收,需重复激光治疗。1个月后视网膜前出血均基本吸收,平均18.92 d,硬性渗出也明显吸收,患者主诉视力较治疗前均有增进,提高2~8行(眼前数指到0.1计为1行),平均6.0行,最佳矫正视力为0.15~1.00。合并PDR且出血不规则的1眼虽然视网膜前出血吸收,但是遗留黄斑前膜及硬性渗出,视力仅提高2行,至0.15。1眼Valsalva视网膜病变患者病程较长(35 d),年龄68岁,视网膜前出血虽吸收,但遗留块状硬性渗出影响视力,视力仅提高4行,至0.2。1眼外伤引起的视网膜前出血,范围较大,出血吸收后遗留点、片状硬性渗出。出血完全吸收的时间及视力提高程度与是否合并原发病、病程长短、视网膜前出血范围大小密切相关。出血吸收最快的为1眼Valsalva视网膜病变患者,22岁,男性,病程5 d,舟状视网膜前出血范围约2 PD,治疗后5 d出血即完全吸收,视力增至1.0;最慢的为1眼合并PDR患者,55岁,男性,病程25 d,出血不规则,开始治疗后约29 d才基本吸收且遗留黄斑前膜及硬性渗出。激光治疗后患眼出血吸收及视力提高情况见表1;典型病例治疗情况见图1。

表1 激光治疗后患眼出血吸收及视力提高情况
Table 1 Hemorrhage absorption and vision improvement after photocoagulation

Diagnosis	Eye	Average time for fully absorbing the hemorrhage (t/day)	Average visionary improvement after treatment(line)		
			1 week	2 weeks	1 month
Valsalva retinopathy	6	14.62	3.7	6.3	7.1
Retinal macroaneurysm	2	18.54	2.3	3.6	5.3
Diabetic retinopathy	4	26.30	2.2	3.2	4.5
Traumatic	1	16.03	4.0	6.0	7.0
Average		18.92	3.0	4.9	6.0

2.2 并发症 术后1个月随访时,病例视网膜前出血基本吸收,视网膜前出血激光光凝处未遗留激光斑痕迹,亦无色素增生,所有病例无其他激光并发症出现。

3 讨论

视网膜前出血是指内界膜和玻璃体后界膜间的出血或内界膜和神经纤维层间的出血,这两种出血不易鉴别,出血量一般较大,呈圆顶状或舟状,新鲜时因血液流动及重力作用在患者坐位时形成液平面,液平面上部为淡棕黄色的血浆成分,下部为鲜红色的红细胞成分^[2]。视网膜前出血多数位于黄斑区,严重影响视力。出血量多者,保守药物治疗待其自行吸收所需时间较长,通常为2个月以上,出血块往往以机化而告终;此外,长期血液刺激可能激发胶质增生而产生黄斑前膜,出血块的分解产物对视网膜还有毒性作用^[3]。所以对于出血量多者应积极采

Figure 1 Fundus photos in one male patient aged 45 years with Valsalva retinopathy before and after photocoagulation. A: About 3 PD pre-retinal hemorrhage from the macular to the hemal arch was observed with subretinal hemorrhage before photocoagulation; B: No obvious florescent exudation was observed on FFA before photocoagulation; C: Part of the laser mark was absorbed at 1 day after photocoagulation; D: Part of the laser mark was absorbed and hard exudation appeared at 3 days after photocoagulation; E: Hemorrhage was significantly absorbed, laser mark was absorbed and hard exudation remained at 10 days after photocoagulation; F: Hemorrhage was significantly absorbed and no pigment proliferation was observed on the laser mark at 20 days after photocoagulation. 45岁男性Valsalva视网膜病变(右)治疗前后眼底图。A:治疗前黄斑区至下方血管弓内见视网膜前出血约3 PD,合并视网膜下出血;B:治疗前FFA图片,未见明显荧光渗漏;C:视网膜激光光凝术后第1天,部分激光斑已吸收;D:激光光凝术后第3天,部分激光斑已吸收,硬性渗出出现;E:激光光凝术后第10天,出血明显吸收,激光斑已吸收,遗留块状硬性渗出;F:激光光凝术后第20天,出血明显吸收,激光斑未遗留色素增殖

取其他方法进行治疗。

早在1989年Tassignon等^[4]就已提出了采用Nd:YAG激光切开玻璃体后皮质将视网膜前出血引流至玻璃体内的治疗方法;Sahu等^[5]于1998年提出了利用氩激光的爆破效应击穿玻璃体后界膜或视网膜内界膜,将视网膜前出血引流至玻璃体内;Chen等^[6]2004年也报道了利用氩激光的爆破效应将视网膜前出血引流至玻璃体内的病例;我国周才喜^[7]也观察了利用氩激光的爆破效应来治疗视网膜前出血的临床疗效。激光引流视网膜前出血的治疗方式对于本身无视网膜基础病变且病程较短的患者简单、有效,可起到立竿见影的效果。但该方法风险较大,若患者配合欠佳可能导致视网膜穿孔、黄斑损伤等严重并发症。且如果病程超过1周,此时血液已经凝固,即使顺利击穿玻璃体后皮质也不一定能成功引流^[8];或合并糖尿病等其他疾病时,出血不规则者也较难成功引流^[9]。对于未成功引流的患者,目前也可施行微创玻璃体切割术,但玻璃体切割术相对较复杂,患者既要承受较重的经济负担,还要承担较大的手术风险,不易被接受。

视网膜激光光凝术虽已应用于眼底病治疗多年,但从未有报道应用于视网膜前出血的治疗。我们大胆设想,将视网膜激光光凝直接作用于视网膜前出血区域,利用激光的热效应、光化学效应以及可被血色素吸收的原理以促进视网膜前出血的吸收。血色素吸收激光后产生的热效应和光化学效应可加速血管扩张,使血流量增加改善血液循环^[10],从而促进视网膜前出血的吸收。由于视网膜前出血衬垫

于视网膜和玻璃体后界膜或内界膜和神经纤维层之间,使得视网膜与玻璃体后界膜之间存在一定距离,发射的激光可被血色素吸收而不伤及视网膜或黄斑^[11],相对较安全。本文观察了13眼采取532 nm激光直接光凝视网膜前出血区域的治疗方法以促进出血吸收,缩短病程,收到良好效果。我们甚至观察到在有些病例,激光黄斑中心下方视网膜前出血后可立即见到上方的血向下涌动,由于重力作用而沉于下方暴露出黄斑区,从而快速增进视力,这种情况通常出现在病程较短且出血呈舟状的病例。

光凝后1周部分激光斑已完全吸收,若出血无明显吸收,可依出血形态重复行视网膜激光光凝治疗,以加速其吸收。本组病例13眼中有7眼(53.8%)需行重复视网膜激光光凝治疗,多数为病程较长、出血面积过大或合并PDR者。治疗1个月后出血基本吸收,平均出血吸收时间18.92 d,较保守治疗所需时间大大减少,且视网膜未遗留激光斑痕迹,无色素增生,无明显激光并发症发生。出血完全吸收的时间与是否合并原发病、病程长短、视网膜前出血范围大小密切相关,若合并PDR,激光治疗后出血吸收较慢,且渗出不易吸收,考虑可能由于糖尿病引起的微循环异常导致视网膜本身的转运功能受到破坏所致。相同疾病病程越长、范围越大,则出血吸收越慢。患者视力均有不同程度提高,平均提高6.0行,患者激光术后视力提高程度与原发病关系密切,无其他合并症的Valsalva视网膜病变的患者视力提高最为显著,1个月后视力提高7.1行。当然在治疗视网膜前出血的同时也要兼顾原发病的治疗,

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【应用研究】

Retcam III 数字视网膜照相机在早产儿视网膜病变筛查中的应用

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Application of Retcam III digital camera in retinopathy of premature screening

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【Key words】retinopathy of premature;Retcam III digital retinal camera;binocular indirect ophthalmoscope imaging system

【Abstract】Objective To observe the application of Retcam III digital retinal camera in retinopathy of premature (ROP) screening. Methods Three hundreds premature infants in our hospital from November 2011 to December 2012 were chosen,the binocular indirect ophthalmoscope imaging system and Retcam III digital retinal camera were used for ROP screening,respectively. The examination results of binocular indirect ophthalmoscope imaging system were set as standard,the sensitivity,specificity,positive and negative predictive values of Retcam III digital retinal camera were analyzed. Results The diagnostic accuracy were made using Retcam III digital retinal camera and binocular indirect ophthalmoscope imaging system in 50 cases (16.67%) and 48 cases (16.00%),respectively,there was no statistical difference in accurate rate ($P>0.05$). In 50 cases with ROP diagnosed by Retcam III digital retinal camera,period I lesions were in 6 cases,period II lesions in 14 cases,period III lesions in 24 cases,period IV, V lesions in 6 cases;In 48 cases with ROP diagnosed by binocular indirect ophthalmoscope imaging system,period I lesions were in 7 cases,period II lesions in 11 cases,period III lesions in 24 cases,period IV, V lesions in 6 cases,there was no statistical difference in period diagnosis between two methods ($P>0.05$). For the diagnostic accuracy,the sensitivity,specificity,positive and negative predictive values of Retcam III digital retinal camera were 100.00%,96.00%,95.10% and 0.23%,respectively. For the pre-threshold and threshold diagnosis,the sensitivity,specificity,positive and negative predictive values of Retcam III digital retinal camera

比如糖尿病视网膜病变患者要先行全视网膜光凝术,视网膜大动脉瘤要同时行瘤体的激光治疗。

对于视网膜前出血的治疗,作激光玻璃体后皮质(或内界膜)切开引流,能迅速放出视网膜前出血而提高视力,确实简单、有效,但当病程较长或合并其他眼底病变出血不规则时就未必能奏效。此时行视网膜激光光凝模式治疗视网膜前出血,光凝黄斑中心以外的视网膜前出血区域,能促进出血吸收、缩短病程,从而改善视力,经观察此治疗方法安全有效,无明显并发症发生,且患者易于接受。但值得注意的是,有时一次光凝不足以使深厚的出血吸收,需依病情行重复激光光凝治疗。且由于观察例数有限,对不同疾病激光光凝治疗量及范围的差异、治疗时机的选择以及光凝出血后对其下视网膜损伤的可能性等问题的分析还有欠缺,有待于进一步收集病例、完善资料,以进行相关论证。

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