
The Effectiveness Analysis of Different Procedure of Nursing Coordination for Phacoemulsification Combined with Intraocular Lens Implantation Surgery

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Abstract: To analysis the effectiveness of different procedure of nursing coordination for phacoemulsification combined with intraocular lens implantation (IOL) surgery. Forty patients who received phacoemulsification combined with intraocular lens implantation surgery from Feb, 2014 to Sep, 2015 in the department of Ophthalmology in the First Affiliated Hospital of Jinan University were recruited for analysis. Patients were divided into two groups randomly: 20 patients with usual nursing procedure (the control group) and 20 patients in improved nursing procedure (the experimental group). The following parameters were collected: intraoperative swelling pain of the eye, operation time, complications of conjunctiva and cornea 1 and 7 days after the surgery, the position of IOL, intraocular pressure, visual acuity and the satisfactory level of surgeon and patients. The significant differences between the two groups were analysis by SPSS 19.0. Compared with the control group, the improved nursing coordination procedure showed less intraoperative swelling pain of the eye, shorter operation time, reduced corneal edema rate 1 day after the surgery, greater satisfaction of both the surgeons and patients. The improved nursing coordination procedure suggests success and safety of this combined surgery by shortening the operation time, reducing postoperative complications and improving the satisfaction of doctors and patients.

Keywords: High Myopia, Phacoemulsification Cataract, Intraocular Lens Implantation, Nursing Coordination Procedure

1. Introduction

High myopia, defined as an eye axial length greater than 26 mm and spherical equivalent -6.00 diopers (D) [1], affects the entire eye [2]. There are relationships between myopia and cataract [3, 4]. In highly myopic patients, cataracts occur more frequently and develop more rapidly [5-7]. According to the literature, high myopia related cataract (HMC) is typically characterized by dark nuclei rather than other types of lens opacity [8, 9]. High myopia related cataract will lead to severe low vision or even blindness, greatly impacting the quality of patients' living life [10]. Phacoemulsification combined with intraocular lens implantation is the prior option to cure the disease [11, 12]. The therapeutic effects of this combined surgery depends on the nursing pattern and procedure. Many groups have been exploring the coordinating procedure for

phacoemulsification and formed the normal nursing procedure [13]. However, there is still lacking nursing protocols which aim at the high myopia patients with phacoemulsification. Thus, we collected 40 patients with high myopia cataract underwent phacoemulsification and applied two different nursing coordination procedure during the operation, to provide evidences for formulating surgical coordination protocol of these patients.

2. Methods

2.1. Subject

Forty patients who received phacoemulsification combined with intraocular lens implantation surgery from Feb, 2014 to Sep, 2015 in the department of Ophthalmology in the First

Affiliated Hospital of Jinan University were recruited. Patients were randomly chosen for the usual coordination procedure (the control group) or the improved coordination procedure (the experimental group).

2.2. Inclusion Criteria

Consent agreed patients of age between 40 to 85 years old; Emery classification of grade II to III; eye axis ≥ 26.00 mm; refraction ≥ -6.00 D; with no corneal disease, glaucoma, retinal detachment, retinal hemorrhage and eye surgery history.

2.3. Exclusion Criteria

Patients with posterior capsule rupture or vitreous prolapse during the operation or those who cannot followed-up on time.

2.4. Coordination Procedure

Here, we used two coordination procedure during the operation: (1) The usual protocol: Routinely set the ocular perfusion height to 76 cm (the perfusion height of the operation eye equals to the height of the perfusate bottle), set the perfusion pressure to 300 mmHg; adjust the height and pressure according to the surgeon during the operation, nursing passively; (2) The improve protocol: nurses adjust the perfusion height according to the length of eye axis: perfusion height 10 cm lower (76 cm to 66 cm) when eye axis between 26.00 mm and 28.00 mm; 20 cm lower when eye axis between 28.00 mm and 30.00 mm; 30 cm lower when eye axis over 30.00 mm; negative pressure is 250 mmHg; perfusion 5 cm lower after the implantation; nursing actively and predictively.

2.5. Recording Parameters

The following parameters were collected: intraoperative swelling pain of the eye, operation time, complications of conjunctiva and cornea 1 and 7 days after the surgery, the position of IOL, intraocular pressure, visual acuity; the satisfactory level of surgeon and patients by questionnaire.

2.6. Statistical Analysis

Excel database was setup, SPSS 19.00 was used to analyses the data. Binomial categorical variables using the four-grid test or probability calculation; numerical variables using t-test; multinomial categorical variables using the Wilcoxon rank sum test. $P < 0.05$ means statistical significant differences.

3. Results

We analyzed the sex, age, vision, eye axis, eye pressure, anterior chamber depth, lens nucleus grade, corneal endothelial cell density, history of diabetes, history of hypertension, phacoemulsification time, phacoemulsification energy. All these parameters showed no significant differences ($P > 0.05$, Table 1). Then analyzed the intraoperative swelling pain of the eye (Table 2), operation time (Table 3), complications of conjunctiva (Table 4) and cornea (Table 5) 1 and 7 days after the surgery, the position of IOL, intraocular pressure (Table 6) and visual acuity (Table 7); the satisfactory level of surgeon and patients (Table 8). These indicators showed significant differences between the two groups. In both groups, the position of IOL were normal, the aqueous humor was clear, vitreous and fundus showed no abnormal.

Table 1. The general data.

		Experimental group	Control group	χ^2	P
Sex	Male	8	11	0.90	0.34
	Female	12	9		
Age	\bar{X}	63.30	61.85	0.34	0.74
	S	12.96	14.37		
	n	20	20		
Vision	\bar{X}	0.27	0.30	0.38	0.71
	S	0.20	0.24		
	n	20	20		
Eye axis	\bar{X}	27.76	27.89	0.22	0.83
	S	2.11	1.79		
	n	20	20		
Eye pressure	\bar{X}	13.65	14.95	1.80	0.08
	S	2.21	2.35		
	n	20	20		
Anterior chamber depth	\bar{X}	3.16	3.16	0.05	0.96
	S	0.23	0.19		
	n	20	20		
Lens nucleus grade	II	4	4	0.00	1.00
	III	16	16		
Corneal endothelial cell density	\bar{X}	2133.62	2345.63	1.65	0.11
	S	352.79	455.50		
	n	20	20		
History of diabetes	yes	2	1	0.36	0.55
	no	18	19		
History of hypertension	yes	6	4	0.53	0.47
	no	14	16		
Phacoemulsification energy	\bar{X}	0.03	0.03	0.95	0.35

		Experimental group	Control group	χ^2	P
Phacoemulsification time	S	0.02	0.03	1.48	0.15
	n	20	20		
	\bar{X}	0.30	0.43		
	S	0.16	0.37		
	n	20	20		

Table 2. The swelling pain.

	Pain of the operation eye		Total
	Yes	No	
Experimental group	2	18	20
Control group	15	5	20
Total	17	23	40
$\chi^2 = 17.29, P = 0.00$			

Table 3. The operation time.

	N	\bar{X}	S
Experimental group	20	14.00	2.58
Control group	20	19.10	3.09
$t = 5.67, P = 0.00$			

Table 4. Postoperative conjunctival hyperemia.

	N	1d		7d	
		Yes	No	Yes	No
Experimental group	20	2	18	1	19
Control group	20	6	14	1	19
χ^2		2.50		1.00	
P		0.11		0.76	

Table 5. Corneal edema.

	N	1d		7d	
		Yes	No	Yes	No
Experimental group	20	3	17	1	19
Control group	20	12	8	0	20
χ^2		8.64		1.00	
P		0.00		5.00	

Table 6. Eye pressure.

	N	1d		7d	
		\bar{X}	S	\bar{X}	S
Experimental group	20	18.00	5.85	15.40	3.03
Control group	20	17.30	3.48	15.50	3.09
t		0.46		0.10	
P		0.65		0.92	

Table 7. Vision acuity.

	N	1d		7d	
		\bar{X}	S	\bar{X}	S
Experimental group	20	0.70	0.22	0.78	0.28
Control group	20	0.67	0.27	0.74	0.28
t		0.29		0.46	
P		0.77		0.65	

Table 8. The satisfaction level of surgeon and patients.

	Of surgeon			Of patients			Total
	Fair	Satisfied	Very satisfied	Fair	Satisfied	Very satisfied	
Experimental group	0	2	18	0	4	16	40
Control group	1	13	6	3	13	4	40
Total	1	15	24	3	17	20	80
$W=289, P=0.00$			$W=284, P=0.00$				

4. Discussion

Myopia, the most common human eye disorder, affects more than 80% of young people in Asian countries [14]. High myopia defines as eyes with spherical equivalent refractive error of at least -6.00 D and axial length of at least 26.00 mm, which often accompanies with cataract [15]. In China, the prevalence of high myopia is about 1.3% to 26% [16]. Surgeries on high myopia cataract are difficult due to the pathological changes of the eye structure, bearing higher risk rate than normal cataract. The outcome of the surgery depends not only on the proper surgical method and the skills of surgeons, but also much on the doctor nurse coordination during the operation. Some researcher suggested that nursing on patients with phacoemulsification is different from normal cataract, precise coordination procedure should be designed according to the surgical features and nursing difficulties [17]. The importance of postoperative nursing skills with phacoemulsification has been raised [18], however, there is

still no report on the nursing coordination during the operation of phacoemulsification combined with intraocular lens implantation surgery.

High myopia with cataract show the character of scleral wall thinning and softening, decreased compressive tension. If the perfusion height stays unchanged as normal cataract before the operation, eye pressure would temporarily raise up due to the high perfusion pressure during the operation. This will lead to the pain and discomfort of patients. We innovatively adjust the coordination procedure as to lower the perfusion height according to the actual situation, thus perfectly controlled eye pressure and relieved eye pain. Reduce the height of cataract perfusion will avoid deep anterior chamber of patients with long eye axis, can prevent anterior chamber surging due to decreased force on lenticle, thus can greatly reduce the operation difficulty, the risk, the operation time, reduce the rate of postoperative corneal edema and finally increased the satisfaction of both surgeon and patient. Our improved nurse-doctor coordination procedure on phacoemulsification combined with intraocular lens

implantation surgery worth to learn from.

5. Conclusion

By analyzing the effectiveness of different procedure of nursing coordination for phacoemulsification combined with intraocular lens implantation (IOL) surgery, the improved nursing coordination procedure suggests success and safety of this combined surgery by shortening the operation time, reducing postoperative complications and improving the satisfaction of doctors and patients.

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