· Original article ·

Predictors of long – term cataract surgical patient satisfaction found in cell – phone follow – up in a primarily Tibetan region of China

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电话回访应用于边远藏区白内障术后患者的满意度调查分析

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摘要

目的:通过电话回访评估在四川甘孜藏族自治州人民医院进行白内障手术患者对术后视力及舒适满意度的调查分析。

方法:对2012年于我院行白内障手术的患者建立档案,根据术前是否伴有其它眼科疾病和(或)在出院时是否伴有手术并发症进行分类,并对他们在术后3mo进行电话回访,回访评估术后视力恢复情况及是否伴有其它不适。

结果:我院在2012年总共行888例白内障手术,678位患者,其中女性364例(54%),大多数患者(93%)术前双眼视力视力严重下降或盲(<6/60)。在记录的881例手术中,主要的术前伴随眼疾:视网膜疾病30例,慢性虹膜疾病11例;主要术中并发症:角膜水肿44例,玻璃体溢出19例。电话回访结果显示:3mo后508位患者(75%)被电话回访至少一次,在其中参加回访评估的588例手术中,485(82%)叙述相比较与出院时"变好"的视力和(或)伴有不舒适,85(15%)"一样"的视力和(或)伴有不舒适,18(3%)"变差"的视力和(或)伴有不舒适。回访结果显示:术后3mo后,伴有术前眼疾和(或)手术并发症患者中叙述视力差和(或)术后不适的比例相比较不伴有术前眼疾和(或)手术并发症患者显著升高(Chi-square=6.575, P=0.037).

结论:在出院时那些白内障患者特别需要术后3mo回访是可预料的,而电话回访增加了回访的可能性。而且需要提高处理患者手术并发症或治疗术前伴随眼疾的能力必须通过提高当地的眼科服务能力来实现。

关键词:白内障手术;视力结果;患者满意度;藏区

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Abstract

• AIM: To evaluate predictors of patient satisfaction with vision and comfort following cataract surgery in Kandze Prefecture People's Hospital, in Dartsedo, the capital of a Tibetan region of China.

• METHODS: Prospective observational study of all patients undergoing cataract surgery in Kandze Hospital in 2012. Patients categorized in terms of ocular pathology and/or surgical complications at discharge, were contacted at 3mo postoperatively by cell-phone to determine satisfaction with vision and presence of discomfort.

• RESULTS: In 2012, Kandze Hospital conducted 888 cataract operations on 678 patients, 364 (54%) women. Most patients (93%) presented with severe visual impairment or blindness (< 6/60) in the better eye. Among the 881 eyes, the main surgical complications were corneal edema (44 cases) and vitreous loss (19 cases) while the main pathologies were retinal disorders (30 cases) and "old" iritis (11 cases). At 3mo, 508 (75% of 678 cataract patients) were contacted at least once by cell-phone. Of the 588 eyes self-assessed, 485 (82%) were reported "better", 85 (15%) "same", and 18 (3%) "worse" than the time of discharge for discomfort, visual acuity, or both. Significantly more eyes "with pathology" compared with "neither pathology nor complications" at discharge were reported to have discomfort or poor vision at 3mo (Chi-square=6.575, P=0.037).

• CONCLUSION: The need forcataract surgical patient follow-up advice at 3mo is predictable at discharge and increasingly possible with cell-phone technology. However, the ability to assist patients with complications or ocular pathology depends on improving eye care services in the region.

• KEYWORDS: cataract surgery; visual outcome; patient satisfaction; Tibetan region
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INTRODUCTION

The Kham people in the Kandzeprefecture (province), similar to other Tibetan populations, live at high altitude and low latitude enduring a harsh climate, limited food supply and strong ultraviolet rays. Using the Tibet Eye Care Assessment of the adjacent Tibet Autonomous Region the prevalence of blindness (< 6/60) is estimated at 1.4% (13.8% for people > age 50) with 50% due to cataract[1]. Similar to cataract surgical outcome reports in nearby low-income countries, the survey found that the surgical outcome of pseudophakic eyes did not meet the WHO criteria:24% of eyes were blind (< 6/60) and only 59% of eyes had uncorrected vision > 6/18[2-5]. The reason for poor visual outcome could not be determined in the majority of cases[6-7].

In 2012, in response to concerns regarding cataract surgical outcome, the Kandze Hospital Eye Department, in Dartsedo the prefectural capital, began a comprehensive data gathering and reporting system for cataract surgery. It included preoperative conditions (ocular and systemic) intra-operative technique and complications, and visual outcome both for surgery conducted in the central hospital in Dartsedo and in transient surgical "camps" conducted in smaller county hospitals in the region. Kandze Hospital was interested in cataract outcome according to surgical site, technique and surgeon.

The cataract program faced a major challenge with patient follow-up after hospital discharge. Most people (90%) returned to remote areas isolated from roads and subject to long severe winter conditions with no eye care services available to them. Virtually all knowledge of patient satisfaction and visual outcome was lost, including patients for whom follow-up care was strongly recommended.

The rapid development of a cell-phone system, even to remote villages in Kandze prefecture, provided an opportunity to extend cataract surgical follow-up beyond discharge. Coincidentally, cell-phone follow-up for all types of surgery (beyond ophthalmologic) was becoming a necessity directed by the Ministry of Health.

The objective of this study was to determine whether the presence of ocular pathology and/or complications at discharge helped to predict which patients would benefit most from follow-up care and whether cell-phone contact was a feasible means of providing postoperative advice[8-9].

SUBJECTS ANDMETHODS

Routine Data Gathering Kandze Hospital gathered extensive, primarily written, records on all patients admitted to hospital. In July 2008, the Kandze Hospital Eye Department began a comprehensive data gathering and reporting system for cataract surgery in English adopting the Cataract Surgery Record form provided by the International Association for the Prevention of Blindness program of the WHO[10]. The data was gathered both for surgery conducted in the central hospital in Dartsedo and in transient surgical "camps" conducted in smaller county hospitals in the region. This paper only reports findings from the Kandze Hospital. Because of the long distances traveled and the need for housing, all cataract surgery patients were hospitalized at least one day and about 40% for 3d.

People were categorised according to their better eye presenting visual acuity:1) good vision (better than 6/18); 2) visual impairment (less than 6/18, but better than or equal to 6/60); 3) severe visual impairment (less than 6/60 but better than or equal to 3/60); 4) blind (less than 3/60).

Each of the 5 operating ophthalmologists was responsible for virtually all the pre-operative and postoperative patient assessment and counseling on their own patients, as well as visual acuity testing and refraction. Ophthalmic technicians or non-surgeon ophthalmologistsconduct biometric testing (A scan and keratometry). A new Zeiss IOL Master was used beginning in July of 2011.

The individual surgeon was also responsible for documenting all complications and keeping details of follow-up care. Individual surgeons and the hospital director (who was also an ophthalmologist) were informed of the results of their own cases, as well as how they compared with institutional averages and international norms.

The hospital infection control department maintained a strict system for reporting and investigating all major and minor infections throughout the hospital, particularly operating rooms.

Cell-phone Outcome Assessment Objective and Rationale The study objective was to determine which clinical characteristics at discharge were strong predictors of patient satisfaction with vision and comfort (pain, irritation) 3mo postoperatively. Knowing which patients were likely to need additional care, and poor vision despite care, allowed ophthalmologists to remind patients about the importance of follow-up and to counsel them on the reasons for their persistently poor or worsening vision.

Patients were categorized into one of 4 groups based on their clinical characteristics at discharge: 1) surgical complications; 2) pre-existing ocular pathology; 3) both complications and pathology; 4) neither complications nor pathology.

All patients having cataract surgery were asked if they would provide a cell-phone number and agree to contact at 3mo by an ophthalmologist who worked at the Kandze Hospital. Patients with co-morbid eye and relevant systemic conditions, surgical complications or visual acuity less than 6/60 at discharge were flagged for particular attention, which included more frequent attempts at cell-phone contact directly to them or to family members or village leaders.

Kandze Hospital directors and staff saw this cell-phone program as an extension of the quality assurance program, and

Table1 Discharge uncorrected visual acuity by eye and sex

Visual acuity	Women	Men	Total
Near normal (6/18 or better)	204 (40%)	183 (45%)	387 (44%)
Visual impairment (6/60 to less than 6/18)	238 (50%)	200 (48%)	438 (49%)
Moderate and severe blindness (<6/60)	26 (6%)	30 (7%)	56 (6%)
Total	468 (53%)	413 (47%)	881

Note: Missing 7 women.

Table 2 Uncorrected and corrected, post-operative visual acuity

Uncorrected/corrected	6/6	6/9	6/12	6/18	6/24	6/36	6/60
6/6							
6/9	3						
6/12	3	34					
6/18	1	31	86				
6/24		5	39	85			
6/36		4	12	52	53		
6/60			3	21	14	16	
3/60			1	3	5	3	5
225 moved to near normal VA		9	55	161			
13 moved from blindness to visual impairment					5	3	5

not a direct or indirect risk to patients. In the future, the hospital will add "consent" to active follow-up to the surgical "consent" forms. Patients were free to refuse participation by not revealing contact numbers.

The telephone interviews included two specific questions, the answers to which determined the advice given: 1) how has your eyesight changed compared to when you left the hospital, and 2) do you have any discomfort? In cases of bilateral surgery, questions regarding each eye were asked and recorded separately. Those with poor vision and/or persistent discomfort were advised to see a local doctor or return to the Kandze Hospital.

Statistical Analysis Most data are presented as descriptive statistics and summary values. Chi-square statistic was used to investigate the association between surgical complications and/or ocular co-morbidities at hospital discharge and patient status (same or worse) at 3mo.

The research project was approved by the Medical Ethics Committee of Kandze Prefecture People's Hospital. Before the investigation started, the subjects were informed of test methods and significance of the project, and gave their oral consent. All test conducted are noninvasive.

RESULTS

In 2012, Kandze Hospital conducted 888 cataract operations at the base hospital on 678 patients, 364 (54%) women, of which 99 men (31.5%) and 111 women (30.5%) had bilateral surgery. The 678 patients came from 17 out of 18 counties in Kandze prefecture. The average age was 65y (65.3 for women; 65.4 for men). Three boys and 6 girls were under 20 years of age.

Most patients (93%) presented with severe visual impairment or blindness (<6/60) in the better eye. Ten percent (30/314) of men and 5% (18/364) of women presented with visual impairment (6/60 to less than 6/18) in their better eye. Four patients' (7 eyes) survey results are excluded because their postoperation VA was not recorded.

The uncorrected visual acuity in pseudophakic eyes at discharge (day 2 or 3) was very similar for men and women: 44% near normal (6/18 or better), 49% visual impairment (6/60 to <6/18), and 6% were blind (<6/60) (Table 1).

Best corrected postoperative visual acuity was recorded for 479 (54%) of the operated eyes. With correction, the number of people who achieved near normal vision (6/18 or better) in the operated eye increased from 387 eyes (44%) to 612 eyes (69%) for a total of 238 eyes (Table 2).

Of the 881 eyes assessed at discharge, 443 were 6/18 or worse at discharge (Table 3) of which, 9% (40/443) had pathology, 4% (19/443) had complications, 2 people had both pathology and complications, 86% (382/443) had neither pathology or complications.

Table 3 also provides details on preoperative ocular pathology and surgical complications according to discharge visual acuity. Among the 881 eyes, the main surgical complications were corneal edema (53) vitreous loss (23) capsular rupture (20), both capsular rupture and vitreous loss (14). Of the 705 eyes with neither ocular pathology nor complications, 323 (46%) had near normal, 372 (53%) had visual impairment, and 10 (1%) had severe visual impairment or blindness.

Cell-phone Survey Results Over-the-phone assessment and interview forms were completed for 588 eyes (67% of total surgeries 881) among 441 people (65% of the total surgical population 678).

Table 3 Pathology and complications associated with visual acuity at discharge by eye

Principal Cause	Near normal 6/18 or better	Visual impairment 6/60 to <6/18	Severe visual impairment and blindness <6/60	Total
Neither	323	372	10	705
Pathology				
Retinal disease (RD)	30	1	26	57
Old iritis	11	3	3	17
Corneal scar	4	2	1	7
Glaucoma	4		3	7
Sub-total	49	6	33	88
Complications				
Cornea edema (CE)	41	6	6	53
Vitreous disruption	16	2	4	22
CE, vitreous disruption			1	1
Hyphema	7	1		8
Sub-total	64	9	11	84
Pathology and Complicatons				
CE, retinal disease	1		1	2
CE, old Iritis	1			1
CE, RD, glaucoma			1	1
Sub-total	2		2	4
Grand Total	438	387	56	881

Note:Eyes are only counted once;that is combined categories are not also counted separately.

Table 4 Phone-based self-assessment by surgical complication and/or ocular pathology by eye *n*(%)

Pathology or complications at discharge	Near normal (6/18 or better)				Visual impairment and blindness(< 6/18)				Total
	Better	Same	Worse	Total	Better	Same	Worse	Total	
Neither	183 (78)	39 (17)	12 (5)	234 (96)	197 (86)	30 (13)	3 (1)	230 (67)	464[a,b]
Pathology	2 (100)	0	0	2 (1)	44 (76)	12 (21)	2 (3)	58 (17)	60
Complications	8(100)	0	0	8 (3)	47 (90)	4 (8)	1 (2)	52 (15)	60
Pathology and complications	0	0	0	0	4 (100)	0	0	4 (1)	4
Total	193 (79)	39 (16)	12 (5)	244 (100)	292 (85)	46 (13)	6 (2)	344 (100)	588

[a]The self-rating at 3mo were statistically significantly different between the categories "neither pathology nor complications" and "pathology" (Chi-square=6.575, $P=0.037$);[b]The self-rating at 3mo were not significantly different between the categories "neither pathology nor complications" and "pathology and complications" (Chi-square=0.763, $P=0.683$).

Of the 588 eyes self-assessed, 485 (82%) were reported "better", 85 (15%) "same", and 18 (3%) "worse" than the time of discharge for discomfort, visual acuity, or both, with a similar distribution for men and women (Table 4). Of the people with visual acuity less than 6/18 reporting their eyesight "better" since the time of discharge, 86% (197/230), 76% (44/58), 90% (47/52) 100% (4/4) were in the groups "neither", "pathology", "complications", or "both", respectively. Also of note, 100% (10/10) of people with vision 6/18 or better reported their vision as better.

Considering patient self-rating at 3mo in relation to the discharge categories among the 881 eyes, there was a significant difference between the eyes in the group "with pathology" and "neither pathology nor complications" (Chi-square = 6.575, $P = 0.037$). However, the difference between eyes in the groups "with pathology and complications" and "neither pathology nor complications" was not (Chi-square=0.763, $P=0.683$).

Additional Care Following Phone Interviews One non-operating ophthalmologist, who works at the Kandze Hospital, conducted the cell-phone interviews for all patients. The ophthalmologist spent an average of 7min on the phone with each patient (some multiple calls) for a total of about 100h of his salaried hospital time (salary not estimated). Telephone service cost about $0.15/per call, with a total of about 800 calls ($120).

The ophthalmologist recommended 65 people to return to the hospital or to their local clinic (if available) for further treatment:1) 14 people in the near normal visual acuity category (6/18 or better) at discharge who reported moderate or severe discomfort in either eye, regardless of their assessment of vision;2) 24 people in the visual impairment category (6/60 to <6/18) at discharge who reported their eyesight as the "same" or "worse";3) 7 people in the blindness category (<6/60) reported their eyesight as "the same" or "worse".

Few additional details were collected as to whether these people sought or received appropriate additional care, and the outcome of that care. No doctor or facility gathered or reported relevant individual patient data. The Kandze Hospital estimated that 10% of the cataract surgical population (60 to 80) who lived near to the Hospital returned for follow-up because of recommendations through the cell-phone interviews. However, the outpatient records at Kandze Hospital did not include individual patient details regarding treatment or final outcome.

DISCUSSION

At this time, in this region of China, cell-phone follow-up provides the only opportunity to contact most patients following cataract surgery[11-13], eye programs serving rural areas of Eastern Africa describe, but do not evaluate, similar use of cell-phones to support post-operative care, albeit mainly in a pediatric population[14-15]. Another study by the same authors evaluated the impact of outreach strategies (that include cell-phones) to increase detection of glaucoma patients, however the cell-phone component was not tested separately.

The Kandze Hospital cell-phone program specifically targeted patients with complications and/or ocular pathology, *i. e.* those who were anticipated to have a significant visual problem or discomfort following surgery. Those patients were contacted more often and more effort was made to reach them through intermediaries in their family or village. This allowed the ophthalmologist either to check that complications had resolved or to reassure patients that their visual impairment was likely due to underlying pathology, not the surgical care they received. Patients contacted were both surprised and pleased that a hospital doctor took the time and made the effort to enquire regarding their satisfaction with the eye care they received. In fact, this was unprecedented in most patients' experience with health care in the region[16-18].

Patients who had a surgical complication in at least one eye reported their vision as "better" significantly more often than those who had an operated eye with ocular pathology. This is logical, as surgical complications likely improve over 3mo time but eyes with ocular pathology tend to remain the same or become worse.

Patients with pathology and complications in at least one eye almost all rated themselves as "better", likely for the same reason. The immediate post surgical complications improved while the pathology stayed the same or only worsened slightly over the 3mo post-operative period.

The cell-phone program attempted to contact all patients post-operatively, not only those with complications and/or pathology. Continuing this strategy seems reasonable with 45 of the 65 people recommended to have further follow-up not predicted by the presence of complications or pathology at discharge.

Post-operative care from Kandze Hospital in 2012 did not include the provision of glasses. In fact, only 54% of patients had refractive error recorded at discharge. In 238 eyes (27% of eyes refracted) visual acuity improved with refraction, most by several lines. Although the problem has not been solved (how to provide eye glasses either at discharge or at an appropriate time postoperatively) Kandze Hospital, noting the relatively high rate of biometric error, obtained an IOL Master from Carl Zeiss to improve IOL power calculation. At the same time, the hospital purchased a much wider range of intra-ocular lenses powers to customize the lens power for each patient.

Follow-up at an eye care facility was seldom accomplished in this setting, as no eye care services, including eye glass dispensaries, were available outside of Dartsedo city where the Kandze Hospital is located. The situation will improve over the next few years as the Kandze Hospital has establish one, and plans an additional three, Vision Centres in the more remote areas of the Kandze Prefecture. Vision Centres, staffed by trained ophthalmic assistants, will provide follow-up surgical care as well as primary eye care and refractive services.

The next phase of the cataract outcome project will improve the quality of patient cell-phone interviews[19]. On discharge, patients will be provided with a simple eye chart (literate and illiterate) to be read at a measured distance when the ophthalmologist calls. Providing the patient with a way to measure their vision at home (uncorrected or with pinhole) will make phone advice more accurate and enable collection of post-operative visual acuity data, albeit poorly standardised[20-21].

In conclusion, the need for cataract surgical patient follow-up advice at 3mo is predictable at discharge and increasingly possible with cell-phone technology in Tibetan regions of western China. However, the ability to assist patients with known and unknown complications or ocular pathology depends on further development of the eye care system in the region, particularly geographically dispersed vision centres staffed by training ophthalmic technicians.

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