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Patients' attitudes towards the potential use of stability tape to minimize head movements during cataract surgery

Running title: Head taping in cataract surgery

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Abstract

Introduction: Head stabilization may reduce intra-operative risk during cataract surgery, but could be misinterpreted as “restraint”. We wanted to establish patients’ attitudes towards the potential use of stability-tape.

Materials and Methods: One-hundred consecutive patients attending for local-anaesthetic cataract surgery were asked to complete a pre-operative questionnaire. This explored patient concerns and views regarding intra-operative head movement and the potential use of stability-tape.

Results: All 100-patients completed the questionnaire. The median head movement concern score was 2 out of 10 (range 1-9, IQR 1-5). 84% felt stability tape should be offered to all patients and 97% would consent for its’ use. Only 6% voiced concern about the use of stability-tape (95% CI 2.2%, 12.6%).

Conclusion: Patients had low concern for moving their head during surgery. The concept of stability-tape to minimize head movements during cataract surgery was viewed positively by most patients. This strategy may promote safer surgery in selected cases.

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Keywords: Cataract surgery, stability tape, head drift, complications, risk stratification, surgical safety.

Introduction

Cataract surgery remains the most common surgical operation in the UK, with over 400 000 cases being performed each year. ¹ There is an ever increasing demand for cataract surgery (with a predicted 50% increase in cataract referrals over the next 20 years), ² and so it is imperative to develop strategies to improve the quality of surgery, by minimizing risk to optimize outcomes. Risk stratification tools have proved useful in selecting difficult cataract cases for sufficiently experienced surgeons, and have been integrated well into clinical practice and training. ^{3,4} Intraoperative patient head movement, however, is yet to be included in such risk stratification tools. Head drift during cataract surgery has previously been demonstrated and measured, ⁵ a scenario which can make “straight forward” cases much more challenging in our clinical experience.

A simple method to reduce intraoperative head movement during cataract surgery is to stabilize the head by using tape from the patient’s forehead to the trolley headrest. This was previously a common practice, but with advancing surgical techniques and changing cultural attitudes (it may be incorrectly interpreted as “restraining the patient”), it has fallen out of regular use. The purpose of this questionnaire-based study was to establish patient views regarding the potential for head taping during cataract surgery and to ascertain if we should be using this tool more readily in clinical practice to increase the safety of cataract surgery.

Methods

A simple pre-operative questionnaire regarding attitudes towards head taping during cataract surgery was designed and distributed to patients attending the Day Surgery Unit, Tennent Institute of Ophthalmology, Gartnavel General Hospital, Glasgow, UK for local anaesthetic cataract surgery. The questionnaire included four questions preceded by a brief explanation of how head movement can negatively impact cataract surgery and how the use of “stability tape” can improve surgical safety [See Figure 1]. Patients were also given the opportunity to add free text comments when completing the questionnaire to express their personal views.

The questionnaire explored patient concerns regarding intra-operative head movement using a linear analogue scale of 1-10 (1 least to 10 most concern), asked if they felt stability tape should be offered as an option, if they would consent to its’ use, and if they had any concerns about this practice. If head tape was required during surgery, a follow-up questionnaire was completed recording how helpful the patient found the tape (1 = not helpful, 10 = extremely helpful), and if they had any complaints based on their experience [See Figure 2].

Following guidance from our local statistician we planned to ask 100 consecutive patients attending for local anaesthetic cataract surgery to complete the questionnaire on the day of surgery.

Results

All 100 consecutive patients attending for local anaesthetic cataract surgery from February 2018 to August 2018 completed the pre-operative questionnaire. Average age was 75 years (range 35-92). Thirty-nine were male and 61 female, thirty-five were right eyes and 65 left. Almost half (51 patients) were having 1st eye surgery. The median head movement concern score was 2 out of 10 (range 1-9, IQR 1-5). There was no correlation between concern score and patient age (Pearson correlation - 0.156, $p=0.121$). Median head movement concern score was 3 out of 10 (range 1-9, IQR 1-5) in those having 1st eye surgery versus 2 out of 10 (range 1-9, IQR 1-4) in those having 2nd eye surgery; there was no statistical significance comparing concern scores between these two groups ($p=0.159$).

84 out of the 100 patients surveyed (84%) felt stability tape should be offered to all patients, with 97 patients (97%) agreeing that they would consent for its' use if and when required. Only 6 patients (6%) reported any concern about the potential use of stability tape during their cataract surgery (95% CI 2.2%, 12.6%). Five of these 6 patients added a free comment voicing their concern; comments included feeling "restrained", "restricted", "confined", and "claustrophobic". Conversely, 12 of the 94 patients with no concern regarding the potential use of stability tape chose to leave a comment [See Table 1 for patient comments between both of these groups].

Of further interest, 2 patients in our study with Parkinson's disease-related tremor required head taping for their cataract surgery. On completion of the follow-up questionnaire, both these patients found the stability tape to be helpful and reassuring

during surgery (both scored 10 out of 10 when asked how helpful they found the stability tape), had no complaints, and had no surgical complications.

Discussion

The concept of potentially using stability tape to minimize head movements during cataract surgery was viewed positively by the vast majority of our patients. Only 6% reported some concern for this potential practice; this was somewhat lower than initially anticipated. Additionally, 84% of the patients felt stability tape should be offered to all patients (regardless of movement concerns) and 97% of the surveyed patients would consent to its' use if preferred by the surgeon. This raises the following question - should we be offering stability tape more readily in cataract surgery, not just to reduce movement, but to reduce patient anxiety?

Head movement is a recognized problem during cataract surgery,⁵ it is therefore important to explore the potential causes for this and the nature of the head movement that may result. From our clinical experience, sudden, unexpected intra-operative head movement can quickly lead to a surgical complication. This may simply be due to patient anxiety, sneezing/coughing, or occur following a loud unexpected noise in the operating theatre. On the other hand, if the patient is too relaxed and falls asleep during ocular surgery, this may result in sudden unexpected head movement as the patient regains consciousness.⁶ Similarly, if the patient receives sedation pre-operatively this may result in erratic head movement during surgery.⁷ Constant high amplitude head movement can occur in Parkinson's disease, as was observed in the two cases mentioned in our study. Such patients are not always fit for general anaesthetic, so additional strategies need to be adopted to minimize their surgical risks. Intravenous remifentanil or propofol infusions have proved useful in suppressing parkinsonian tremor for cataract surgery; however, this requires

anaesthetic expertise which may not be readily available on dedicated local anaesthetic cataract lists.^{8,9} Head taping is a less medically invasive option which was proved to be successful in controlling head tremor in our two cases, with high patient satisfaction. Finally, a more subtle form of intraoperative patient movement is head drift. This can occur in otherwise healthy individuals and gradually results in loss of centration of the operating microscope and loss of focus.⁵ If the head drifts medially this can promote pooling of fluid in the inner canthus subsequently submerging the corneal surface and further deteriorating the operating view.

If head stabilization is required for cataract surgery due to any of the above reasons, what method should we be using? Taping the patient's head in conjunction with a donut-shaped headrest has previously been described to minimise head movement during cataract surgery.¹⁰ Head taping is a simple and effective method for reducing head movement and was widely accepted by patients in our study. However, removing the sticky tape after surgery can be quite uncomfortable for the patient. Adhesive removers have previously been applied to the portion of tape that rests on the patient's head, however, these are flammable and their effectiveness is questionable.¹¹ A bouffant cap can be worn by the patient underneath the tape, though this reduces the effectiveness of head stabilization due to the poor adhesion to skin. Velcro straps are a reasonable alternative to tape, however, there would be significant costs due to infection control restrictions and single use disposal.¹² Another approach to securing the patients head during cataract surgery would be to use a customized head rest. An "L" shaped head rest (Philips-Mackool head rest)¹³ has been demonstrated to be effective in temporal incision cataract surgery, with the vertical component of this head rest in contact with the patients contralateral cheek

during surgery. This prevents the patient's head from rolling away from the surgeon during cataract surgery. Other head rests, also suitable for superior incision cataract surgery, have been described which cradle the patient's head to provide support.¹⁴⁻¹⁶ However, no studies have been conducted to report the effectiveness of these products.

As part of the pre-operative cataract assessment, it is important to recognize patients who may specifically benefit from stabilization from head taping and consent them appropriately. If the patient is deemed to lack mental capacity, however, the Mental Capacity Act 2005 (England and Wales) or the Adults With Incapacity (Scotland) Act 2000 should be considered where appropriate.¹⁷⁻¹⁸ The legal definition of restraint is defined as "a measure or condition that keeps someone or something under control".¹⁹ Based on this definition head taping may be interpreted as restraint. The Mental Capacity Act permits restraint to be used if it is in the patient's best interest, however, Deprivation of Liberty Safeguards (DoLS) should be sought if the restraint deprives the patient of their liberty.¹⁷ In England and Wales, if a patient lacks capacity yet head taping is deemed to be in the patient's best interest then arguably we should be completing a DoLS assessment pre-operatively. Medically, restraint can be defined as physical or chemical.²⁰ General anaesthetic could therefore be interpreted as restraint, as could other physical immobilization techniques such as casts in orthopaedics or stirrups in gynaecology. Clearly the concept/ culture of restraint varies between departments, staff, and most importantly patients. To address this issue, we ensure patients are appropriately consented by including "head taping" on the patient's cataract consent form or Adults with Incapacity Act form if the patient lacks mental

capacity. In other centers in the United Kingdom, separate and specific consent may be needed for restraint as per local policy.

In our study, as well as gaining patients' views on the use of stability tape we also surveyed patient concerns regarding head movement during cataract surgery; the purpose of this was to identify patients who would prefer to have stability tape for extra reassurance. The median head movement concern score was 2 out of 10; suggesting that most patients feel confident about keeping their head still during cataract surgery. We had hypothesized that younger patients and 1st eye cataract surgery cases would be more concerned about head movement during cataract surgery. However, there was no correlation between age and concern scores, and although the median concern score was 3 out of 10 in 1st eye cataract surgery patients versus 2 out of 10 in the 2nd eye cases, there was no statistical significance ($p=0.159$). For patients who had greater concern scores than the average results, the free comments on the questionnaires suggest that stability tape would be comforting; indeed, patient number 71 stated they would actually prefer to have the tape. It would be interesting in future studies to assess if stability tape reduces patient anxiety by using a validated patient surgical fear questionnaire.²¹ If surgical fear is reduced with head taping, perhaps we should be offering this option to patients as part of routine cataract pre-assessment.

Conclusion

Patients had low concern for moving their head during cataract surgery, however, concerned patients may be reassured by the use of stability tape. The concept of stability tape to minimize head movements during cataract surgery was viewed positively by patients. 6% of patients, however, reported concern towards the “tape and drape” approach; this should be explored during the consent process so patients are fully informed regarding the surgical procedure. Stability tape has the potential to improve the patient experience and outcomes of cataract surgery in selected patients, in particular those with parkinsonian head tremor and/or anxiety.

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Conflict of Interest

The authors declare that they have no conflict of interest.

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Legend:

Figure 1: Pre-operative head movement and stability tape questionnaire

Figure 2: Post-operative head movement and stability tape questionnaire

Table 1: Patient comments regarding the use of stability tape in cataract surgery