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ARTICLE

The highs and lows of Medisoft as an audit tool: lessons from a 5-year upper eyelid ptosis audit

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Abstract

Background Increasing demand for surgeon accountability requires regular audit of individual and institutional performances. Electronic record systems proclaim efficient audit systems, but how does Medisoft live up to the hype? We present our experiences and examine how well Medisoft's audit suite meets clinical audit needs.

Methods Medisoft audit suite was used to audit all ptosis procedures undertaken during 2010–14 in Gloucestershire Hospitals NHS Foundation Trust. Repeat audit identified all ptosis procedures done in the trust since Medisoft was introduced; these data were cross-referenced to determine true re-operation rates.

Results 350 operations were performed on 304 patients over 427 eyes in 5 years. 40 of 304 patients (13%) have thus far required more than one operation on at least one eye. Cross-referencing the data revealed that 11 of these patients' audit-period operations were re-operations, and 18 patients were re-operated after the audit period. In total 26/40 patients (65%) would have been missed if the data had not been cross-referenced. 17 patients had post-operative complications recorded, 7 of whom had repeat surgery.

Conclusions Medisoft supports high volume audits, reducing overall workload and increasing efficiency. However, consistent use across clinical staff is necessary to ensure all data are recorded and available for audit. When assessing re-operation rates, search parameters must be widened and cross-referenced to prevent missing vital information regarding procedures performed outside of the audit window. This could be eliminated in future if Medisoft made small changes to input of data that highlights repeat operations and their indications.

Introduction

Increasing demand for surgeon accountability requires regular audit of individual and institutional performances. Electronic medical record (EMR) systems offer opportunities for rapidly accessible patient data and can facilitate such required evaluations. Ophthalmology is particularly well suited to the use of EMR systems due to high volume outpatient-based care, and the Royal College of Ophthalmology have produced guidelines around their introduction [1]. EMR systems are already widely utilised in ophthalmology with a 2013 study identifying that 45.3% of responding ophthalmology units currently using an EMR and a further 26.4% planning to introduce one; 70.8% of those units using an EMR were using Medisoft [2]. Whilst other ophthalmology-intended EMRs are available [3], Medisoft is the only one that offers an audit suite able to generate meaningful data with just a few moments' work [4, 5]. Thus far, it has been used to produce high volume audits for a variety of subspecialty purposes, including identifying patients with stable disease, and evaluating real-world outcomes of procedures [6–9]. Notably, it provides low effort, high yield data for the National Ophthalmology Database, which audited more than 200,000 cataract operations that were undertaken in 2017–2018 [10, 11]. Many audits of interventional outcomes focus on visual function data such as visual acuity or visual field indices, which are routinely entered as part of a patient's assessment. In oculoplastics, many outcomes are either subjective or not routinely recorded, and thus auditing these patients with Medisoft may not generate as much useful data as other subspecialties. We undertook an audit of upper eyelid

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ptosis procedures performed over a five-year period, with a minimum of 5 years' follow-up, using Medisoft audit suite and present here our experiences.

Materials and methods

Medisoft audit suite was used to audit all ptosis procedures performed within Gloucestershire NHS Hospitals Foundation Trust over a 5-year period (2010–2014) to ensure all patients had a minimum 5-year follow-up period. 'Brow ptosis repair' and 'facial nerve palsy lid elevation' procedures were excluded due to the significantly differing underlying pathology and indications for surgery. The same audit data were then generated covering the date that Medisoft was first introduced in the trust, up to the audit date. These data were cross-referenced to identify two sets of patients that would impact the interpretation of surgical outcomes: firstly, it highlighted patients who underwent ptosis repair during the audit period for whom this was a reoperation, secondly, it identified patients who had repeat surgery done after the audit period.

The EMR of all patients requiring more than one operation to either eye was then reviewed, exploring indications for repeat surgery, timing of repeat surgery, risk factors for requiring repeat surgery, and seniority of the initial surgeon. Re-operations undertaken within 1 calendar year of the initial operation were categorised as 'revision' surgery, with those performed more than 1 year later categorised as 're-do' surgery.

Results

Overview

Medisoft audit suite generated data on the following outcome measures: number of operations, distinct patients, distinct eyes, eye operations and procedures (including breakdown of these); presence and numbers of different co-pathologies, changes in visual acuity status post-operatively; names and grades of surgeons with numbers of operations they performed, which hospitals the operations took place in; types of anaesthesia and recorded complications, intra-operative and post-operative complications; patient demographics. It also automatically calculates percentages for appropriate fields. Clicking on any field of interest reveals patient details to allow further exploration via the patient records.

Our audit showed that 350 operations (unilateral or bilateral) were performed on 304 patients over 427 eyes over the five-year audit period. 55% of operations were on females. 75% of operations were undertaken by consultants, 91% under local anaesthesia. Only 17 patients had post-operative complications recorded (some had more than one)—eight under-corrections, three over-corrections, two dry corneas, two recurrences, four eyelid oedema and two 'other'.

Multiple operations

68 of 304 patients had more than one operation, but 28 of these were sequential unilateral surgeries (each eye only operated on once), leaving 40 patients (13%) who required 2 or more operations on at least one eye, of which 10 (3.3% of all patients) required 2 or more operations on both eyes. Thus, 50/427 eyes (11.7%) required reoperation; consultants were the initial operating surgeon in 59% of these patients.

11/40 patients were determined to have undergone reoperation during the audit period having had primary surgery before this. Furthermore, 18/40 patients were identified as requiring reoperation after the conclusion of the audit period. Due to some overlap in these patients, this meant a total of 26/40 patients (65%) would have had been missed in analysis of reoperation rates had the audit period data not been cross-referenced with the complete dataset.

Complex cases

11/40 patients (13/50 eyes) requiring more than one operation were found to be 'complex' whereby the underlying diagnosis was not involutional ptosis, increasing the pre-operative likelihood of needing repeat surgery; examples include chronic progressive external ophthalmoplegia and ocular myasthenia gravis. Excluding the eyes with complex needs that were re-operated lowers the overall re-operation rate to 8.7%.

12/427 eyes (2.8%) were revised, 38/427 eyes (8.8%) re-done. 4/12 revisions and 9/38 re-dos were for eyes with complex needs. Excluding complex eyes lowers the revision rate to 1.8% and re-do rate to 6.8%.

Discussion

Reoperation rates

There is no clear consensus on acceptable reoperation rates for blepharoptosis repair. The British Oculoplastic Surgical Society (BOPSS) state that over or under-correction is recorded in up to 20% of cases [12], but this does not necessarily correlate with requiring further surgery. A 2012 systematic review discussed a study by Simon et. al that reported a reoperation rate of 18%, whilst another larger study by McCulley et al. had an 8.7% revision rate but

acknowledged a further 14% did not meet criteria for surgical success but declined more surgery [13, 14]. Our results, though only reporting reoperation rates, appear superior to these results, with only a 2.8% revision rate and 11.7% overall reoperation rate in patients that had a minimum of 5 years' follow-up.

Input of data

It is only possible for Medisoft to generate audit outcomes based on the data input during the patient's clinical care. All clinicians in Gloucestershire record operation details using Medisoft. Most of the clinician body in Gloucestershire hospitals exclusively use ERM to record their clinical consultations with patients. However, a small number continue to utilise paper records and dictated letters instead; these letters are uploaded as PDF files attached to the patient's ERM so the information recorded in letters is available electronically but paper records would need to be consulted to review examination findings, for example, that may not have been included in the letters. Furthermore, those not using ERM routinely do not have the same opportunities to record post-operative complications, as is prompted in every clinical consultation record when using Medisoft. It is possible to record specific measurements such as upper lid marginal reflex distance (uMRD) and lid show in Medisoft's clinical examination proforma but in the author's experience, this is not routinely completed, making high quality audit of objective surgical outcomes problematic.

Approaches to audit

Medisoft audit suite is capable of producing almost instantaneous analysis of a wide range of conditions and interventions [4, 7, 8]. Depending on the specific standards the auditors wish to evaluate, this may be the only effort required on their part to generate a wealth of data. However, if they require further information relating to specific outliers or an outcome that is not routinely reported, additional work may be necessary to drill down into the data, perhaps resorting back to reviewing individual patient records. Furthermore, where patients require subsequent interventions, perhaps repeat or different form of surgery, these may not be picked up by the audit data initially requested; it is important that auditors consider whether cross-referencing with wider audits would be helpful to ensure these are not missed.

Limitations

In 2005, BOPSS set out specific criteria by which the outcomes of corrective surgery for blepharoptosis could be judged as 'successful', incorporating objective data such as (uMRD) and the amount of asymmetry between eyes in uMRD, lid show, skin crease and lid contour [15]. The Medisoft audit suite does not automatically produce these data, so the EMR of every patient included in the audit would have to be reviewed and these data collected to establish our surgical success rates as per BOPSS criteria. These data were not collected because, in the author's experience, there would be very few patients with these data recorded in Medisoft. Re-operation rates have been used as a proxy for clinical success rates, but as patient-reported satisfaction rates are higher than surgeon satisfaction, it is likely that many patients not meeting 'objective' success from their surgery would not pursue repeat surgery. Furthermore, choose and book systems that allow patients to decide where they receive clinical care, the option of private healthcare and potential for patients moving outside the usual catchment area of Gloucestershire hospitals means that patients may have had repeat surgery that is not captured by our audit. It should also be noted that since we only captured patients operated on since the introduction of Medisoft to the trust, it is possible that some patients had undergone primary surgery prior to this and were re-operated during our audit period; these will have been treated as primary operations in our analysis. As we have incorporated the 11 patients who received primary surgery prior to the audit period, and reoperation during it, whilst calculating our percentage reoperation rate, our reported reoperation rate is in fact mildly elevated—excluding these eyes would reduce our reoperation rate for that 5 year period of patients down to 9.1% from 11.7%.

Recommendations

There are some simple measures that can be taken by individuals to maximise the quality of audit data generated using Medisoft's audit suite. Encouraging all clinicians within a department to exclusively use the EMR to record their consultations will prevent the need for paper record reviews, which are time-consuming, laborious and have pragmatic challenges as it usually requires the assistance of administrative staff to obtain them. It will also increase the chances of post-operative complications being recorded.

Where specific objective outcome criteria exist as is true for ptosis repair, clinicians should be encouraged to familiarise themselves with these (particularly trainees, who may rotate through the subspecialty and be unaware of them). They should be encouraged to record these data in their consultations where possible so that datasets are complete and high-quality audits of outcomes can be undertaken.

As with any information healthcare technology, Medisoft is constantly being refined to produce the most comprehensive, efficient, and user-friendly system. We propose

that minor alterations of the audit suite algorithms could prevent the need for timely cross-referencing by generating data on patients who have had more than one operation of the calibre being investigated. Furthermore, at the time of data input, if a procedure is being recorded that is of similar coding to a previous one (for example, levator resection and levator advancement), Medisoft could prompt the user to confirm whether this is a re-operation, and the indication for this, for example under-correction or recurrence of condition. These data could then be included within the audit suite data outputs.

Conclusion

Medisoft is the only EMR in ophthalmology that supports high volume audits, generating a large amount of data with minimal effort. However, the data it can generate are only as good as the data input to the system, and we would encourage all clinicians working in a department that uses EMR to exclusively record their data using that system. Current limitations of the Medisoft audit suite include identifying reoperation rates or generating output data related to procedure-specific objective outcomes used to determine 'success rates', such as uMRD for blepharoptosis. As such, there is currently a need to carry out wider audits for cross-referencing to identify reoperation rates, and individual patient records would still need to be reviewed to obtain this procedure-specific information. The author hopes that future refinements to the inputting of data, or audit suite algorithms, may resolve these issues and allow for even higher quality auditing at the tips of our fingers.

Summary

What was known before

- A 2013 study showed that 70.8% of ophthalmology units using an Electronic Medical Record (EMR) system were using Medisoft, and 20% of institutions were planning to introduce an EMR soon.
- Medisoft audit suite is the only EMR that allows real-time audit of patient outcomes.
- Medisoft audit suite has been used to generate high volume, real world data on many conditions, including wet age-related macular degeneration.

What this study adds

- This study used Medisoft audit suite to audit 5 years' worth of patients who underwent ptosis surgery, with a minimum of 5 years' follow-up, which we believe is the first study to present such long follow-up data.
- The current audit suite does not automatically generate surgical outcome data for one-off procedures whose primary outcomes are not visual acuity, and a second audit must be undertaken and cross-referenced to establish re-operation rates.
- Medisoft can only produce data that is input—consistent use amongst all clinicians across a unit, and high quality data input helps generate high quality data output.
- A few minor changes to Medisoft in future may enable data such as re-operation rates and indications to be audited rapidly in future.

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Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

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