Translating learning to achieve day case total shoulder arthroplasty – our experience in Torbay

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Abstract

Torbay hospital is a medium sized district general hospital in South West England with three upper limb specialist orthopaedic surgeons. Having successfully instituted a pathway for day surgery hip replacement in September 2018, we were able to translate learning from this to our care pathway for shoulder replacement. This account details our day surgery shoulder arthroplasty pathway and exemplifies an approach to transforming inpatient to day surgery pathways which could be extrapolated to other procedures or disciplines.

Introduction

Over 11,500 daycase procedures are done annually at Torbay hospital and the day surgery unit is nationally respected for its ethos and outcomes. We regularly perform uni-compartmental knee replacement (national top performer), laparoscopic hysterectomy, paediatric tonsillectomy, and transurethral resection of prostate surgery as day case procedures.

We are a medium sized district general hospital in the South West of England. Our day surgery unit comprises four operating theatres and ancillary space, self-contained but physically connected to the main hospital. We perform more daycase procedures per year than we can presently accommodate within our dedicated day surgery theatre capacity and as such we have a long established pathway whereby patients may have their surgery in inpatient theatres and be transferred to the day surgery unit for completion of their recovery and subsequent discharge home. The existence of this practice has allowed us to widen it to those patients requiring surgery or procedures in specialist theatres (in this case, laminar flow).

Annually as a trust we perform approximately 50 elective upper limb joint replacements; typically, 42 shoulder replacements and 8 elbow replacements. National Joint Registry data shows our patient demographic has a higher than national average representation of ASA3+ patients (American Society of Anaesthesiologists Physical Status classification system) undergoing upper limb joint replacement procedures; 45% ASA3+ vs national average of 29% for shoulders and 47% ASA3+ vs 33% for elbow replacement [1].

Translational learning

In September 2018 we successfully introduced day case hip replacement in our trust. This was a multi-professional team endeavour involving anaesthetists (myself, Dr A Bougeard & Dr M Stocker), surgeon (Mr M Kent), nursing (Mrs J Allen & Mrs A Alen) and physiotherapy (Mrs B Sullivan).

The pathway has the following features:

- meticulous pre-assessment and preparation
- utilising our pre-existing joint school to include appropriate counselling about day case discharge
- use of a short acting prilocaine spinal
- regular antiemetics
- intra-operative goals of normothermia, normovolaemia, blood conservation.
- post operatively a supported discharge with physio input ensuring patient confidence in mobilisation
- early post op follow-up in the community delivered by a dedicated team of orthopaedic outreach nurses
- bespoke analgesia regimen clearly communicated to promote confident self-management by the patient

To date we have performed 30 cases with 93% same day discharge and no complications. The two patients in our Total Hip Replacement (THR) cohort to date that failed day-case discharge were the two patients where there was deviation from the care protocol.

The idea

In the upper limb team, we began to consider if we could start offering total shoulder replacements as day case procedures in our trust. Learning and experience from the hip and other complex day surgery procedure pathways is that medical co-morbidities can be optimised, and techniques adjusted for, and are often not the barrier. In a well-planned case with a suitable operation and surgical technique, appropriate anaesthetic technique, high quality analgesia, and adequate time for recovery with appropriate support and rehabilitation, then day case discharge is likely to be achievable. A key requisite is patient engagement and belief in the pathway – the moment a patient doubts it, or staff in contact with the patient are not universally supportive the chance of day case discharge decreases sharply.

Assessing current practice for pathway redesign

Introducing a new clinical pathway often represents an adaptation of an existing pathway rather than de novo creation. A pathway that facilitates same day discharge will contain the same elements as an inpatient pathway, but they may need to be provided for differently.

By looking at what is currently happening during an inpatient stay, the requirements for a day case pathway can be established.

Why are your patients staying overnight in hospital? - is something active being done? – if so, might that activity be able to be done in the community by a district nurse, an outreach nurse from the

hospital or by a next day outpatient appointment?

Are they staying in hospital simply because that is what has always happened before?

Are they in pain? – then review your current management and see if a pain protocol can be developed that allows patients to continue effective analgesia in their own homes?

Is nausea a problem?

Is urinary retention a problem?

Social and psychological support for patients is important – it requires good communication at every stage; appropriate and consistent written and verbal information; contact details and confidence in response in case of concerns. Historically all our day case patients have received a day 1 follow-up phone call from our day surgery nurses: wellbeing status, satisfaction and feedback are recorded, and any questions answered. This additional information, over the years, has given us an extensive database of direct patient feedback which informs our refinement of pathways and processes. We also planned to supplement this with additional patient feedback to support the learning around new pathway introduction.

The reality

Our first daycase shoulder replacement patient had their surgery in June 2019. Having discussed the idea of doing a pilot daycase shoulder replacement case for a couple of months it transpired that our first suitable case was a revision procedure.

The patient was a woman in her early 50s who had undergone hemiarthroplasty replacement for inflammatory arthropathy 2.5 years previously (as she had rotator cuff deficiency and was thought at that stage too young to consider primary reverse arthroplasty). Unfortunately, after early promising pain relief she developed significant pain due to glenoid erosion. Inflammatory markers, aspiration and Synovasure for possible infection were all negative and she was listed for a one-stage revision to a reverse polarity shoulder replacement. In all other aspects she was ideal, highly motivated and engaged with idea of day surgery. Relevant past medical history included both rheumatoid and psoriatic arthropathy but no cardiac, respiratory, or renal disease. Her regular medications included methotrexate, TNF inhibitor (Adalimumab, which was stopped two weeks pre op), co-codamol and gabapentin.

Pre-op

Our index case was identified at point of listing and was receptive to the idea of day surgery when the idea was raised: she valued being able to rapidly return to her own environment to complete her recovery from surgery. As a team we had the advantage of both having met her before as we had been the operating surgeon/anaesthetist for her primary hemiarthroplasty procedure. At consent clinic it was reinforced that the plan for her surgery was day case but with reassurance that would only go ahead if all were well and that both we and the patient were happy with that.

On the day; anaesthesia

The patient underwent standard pre-operative preparation on our admissions ward and had taken her carbohydrate pre-op drinks as advised. She was given oral pre-medications of Paracetamol 1g and Oxycodone MR 10mg.

The anaesthetist performed their standard anaesthetic technique for shoulder replacement; an awake in-plane ultrasound guided upper trunk interscalane block in combination with a superficial cervical plexus block (0.25% levobupivacaine; total volume used 30mls) followed by induction of general anaesthesia with TCI Propofol + Remifentanil. The patient was intubated with a RAE 7.0 endotracheal tube. Other drugs administered included rocuronium single dose at intubation (30mg), dexamethasone (6.6mg), ondansetron (4mg), teicoplanin (400mg), gentamicin (240mg) and tranexamic acid (1g).

The surgery was performed in beach chair position with pressure controlled-volume guaranteed ventilation (PCV-VG) at 6mls/kg. The rest of her anaesthetic management included active patient warming throughout (forced air blanket + fluid warmer) cell salvage collection (insufficient volume collected to warrant processing) and use of foot pumps to reduce venous thromboembolism risk. Total volume of IV fluids administered was 1500mls. The patient was not catheterised.

The patient was listed as the first case on our theatre list. Her anaesthetic start time was 09.03 and we transferred into theatre at 09.21. Preparation, positioning, time out and draping was performed, and incision was at 10.02. Total surgical time was 2hours 28mins. The patient was extubated in theatre and then transferred to our main theatre primary recovery area at 12.40. She was alert and conversant rapidly and confirmed she was comfortable. A build up drink (Fortisip) was provided and oral fluids commenced. Shortly after this she was transferred to our day surgery unit to complete her recovery.

She was discharged home at 17.59hrs, 5 hours 20mins after leaving theatre.

Discharge medication included: oxycodone 10mg MR bd 2/7 (5 tablets only issued); ondansetron 4mg tds 2/7; paracetamol 1g qds 5/7; macrogols bd 5/7. On day 3 analgesia was stepped down to codeine qds.

The post-discharge analgesia plan was modelled on our successful day case hip replacement pathway.

(Obviously, there can be some concern about sending patients home with strong opioids and potential for addiction. We have a dual documentation approach to this whereby there is an automated entry on the computerised GP discharge summary as well as dedicated patient documentation which reinforces the non-continuation of this medication after the initial 5 doses.)

When developing the patient pathway for our daycase hips a patient medication administration sheet was developed which tabulates when next doses are due and gives patients explanations of what each of their issued TTA medications are for, dose frequency and duration. Feedback from this was that it was highly user friendly and patients felt supported and confident in self-managing their pain control at home.

This chart has been adapted for our shoulder replacement pathway. In addition to information on self-administered analgesia, patients are also given post-operative information about caring for their 'numb' arm along with contact information for support/concerns.

On the day; surgical aspects

The surgical procedure was revision of an uncemented Epoca hemiarthroplasty to an Exactech reverse shoulder replacement (uncemented). It was performed by standard surgical technique via a deltopectoral approach. There were no surgical complications. Post op X-Ray was performed and reviewed by the surgeon before the patient was discharged.

Post op

Telephone feedback was taken on days 1, 4 and 7. The patient reported herself absolutely delighted with her care and experience as a day case and felt her care had been friendly and efficient and she had been well supported throughout. Her nerve block wore off overnight on the day of surgery (approximately 15hours) and there was zero sensory or motor deficit by 24 hours post op. At this point she had had two doses of oxycodone (10mg as a pre-med and 10mg at 1900hrs on day 0). Her pain was well controlled, and she found the transition when her block wore off very manageable. She reported feeling 'Very Good' and quoted 'none' when asked about her level of pain. When she stepped down to the codeine, she reported that her pain control was satisfactory, but she felt more sleepy. No nausea, vomiting or dizziness was experienced at any time. She was able to stop the codeine before day 5. Under guidance from her GP she had also started to slowly wean the gabapentin she had been on before her surgery.

Surgical follow up at 6 weeks showed excellent progress. The patient was completely pain free. Her range of functional movement was improving with physiotherapy & strengthening exercises.

The future

As shown with our hip experience, achieving these procedures as day cases is about building an effective pathway that allows the same high-quality operation to be performed alongside active patient engagement to create a safe and acceptable care pathway. We were able to translate learning from our daycase hip pathway to help shape the design of this pathway - particularly the analgesia and post-operative patient information provision for patients.

Given the increasing pressure on NHS services and the escalating demand for orthopaedic procedures, often compounded by rising waiting list times due to winter bed pressures and cancellations, being able to successfully perform a given procedure as a day case offers significant advantages both to the trust and the patient. Previously published articles have demonstrated patient acceptance and feasibility for daycase shoulder arthroplasty [2]. Indeed, significant reductions have been reported for post-operative complications and 30-day mortality rates in matched cohorts when comparing total shoulder replacement as a short stay procedure versus an inpatient stay [3]. In Duchman et al's review, out of numerous variables studied only 'inpatient stay' was independently identified as a risk factor for 30 day mortality in total shoulder arthroplasty; age, diagnosis of COPD, functional status (dependent/ independent) and ASA (1-2/ 3-4) all had odds ratios with 95% confidence intervals spanning 1.

The drive to translate historically inpatient surgical procedures to day case ones where possible is not just founded on economics, it often translates into health benefits for the patients and excellent patient satisfaction. Our day surgery unit has a motto, “the best bed is your own bed’. Continuous innovation is at the heart of care planning for the future.

We are still at the start of our journey with daycase shoulder replacements but aim to continue. We have since identified a further four patients from our current waiting list and successfully performed two more daycase shoulder replacements (including one since COVID precautions). Our current daycase discharge rate is 100%. As we progress, we will continue to learn and refine our processes. We would encourage other centres to look at their current care pathways and consider what changes could be made to facilitate day surgery pathways.

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