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Abstract

The Department of Health (DH) proposes that 75% of elective surgery should be performed as a day case procedure. It is estimated that in the Unated States of America USA 83% surgeries are performed as a day case surgery (DCS). A number of synonyms exsits for the term day case surgery such as out-patient surgery, ambulatory surgery, one-day surgery. The main purpose of DCS is to perform surgery of selected patients to hospital for a planned surgical procedure, returning home on the same day.

Day surgery service is a part of healthcare centres and are usually performed by general, regional and local anaesthesia or sedation that require short postoperative care and thus not requiring hospitalisation. Day surgery procedures have been introduced gradually and have come to represent a very hight proportion of some surgical procedures.

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INTRODUCTION

Day case surgery is increasingly practiced all over the world but with a lag between the developed and developing countries. According to the Anglo-Saxon literature, the goal of DCS is to meet the criteria of ambulatory anaesthesia which is known as 3 C: care, convenience, and cost-containment. Day case surgery is increasing worldwide and the most important reasons are the reduced number of hospital beds. Other reasons are improvements in surgical techniques, introduction of new and effective drugs, management of postoperative pain and emesis. The concept of multimodal analgesia has become the gold standard of care in day surgery *(1, 2, 3)*. Economy profit is high, less cost-effectiveness and implies social benefits. The hospital costs of day surgery are 25–68% lower than the costs of inpatient surgery for the same procedure *(4)*.

DCS may be a hospital based or freestanding units, a multidisciplinary unit which provide services for a wide range of operations in various surgical specialties or a only one disciplinary unit.

There are available five facilities:

1. Hospital Integrated Unit: This shares either the hospital operating theatre or recovery rooms for inpatients with day cases. A žday case ward' setting provides a separate ward within the hospital for day case patients' recovery but mixes both in-patients and day cases operating sessions. Although this model uses the regular in-patient theatres, these can be used in various ways, ideally by setting aside one or more theatres for only day cases on a given day. This option is unsatisfactory and is not recommended.

2. Hospital Autonomous Unit: It is located on the grounds of a hospital but is self sufficient and independent of other portions of the hos-

pital. It contains its own operating room and postanaesthesia recovery unit (PACU). This was also called a day surgery unit (DSU).

3. Hospital Satellite Unit: It is a facility operated and/or sponsored by a hospital but which is autonomous and situated away from the hospital.

4. Freestanding Unit: This is a completely autonomous and is not a part of any other health care. These are often used by managed health care systems and independent contractors.

5. Office Surgical Facilities: They are individual surgeon's offices for practicing day surgery. They have all the necessary standard with guidelines intended to ensure superior qualitative care *(5)*.

Criteria for DCS are: age less than 70 years, ASA grade I, II or III, BMI less then 30, availability of a responsible adult as accompanying person after discharge, access to a telephone and living within an hour travelling time from the hospital.

DCS requires close co-operation between surgeon and anaesthetist and preoperative screening should be performed (carried by a questionnaire).

In many outpatient centers preoperative visit patients several days before surgery when the anaesthesiologist takes a detailed medical history of patients is usually performed. The patients meet the anaesthetic questionnaire, an overview and his/her laboratory findings and, if necessary, prescribe additional tests. Before surgery patients usually get premedication, short-acting benzodiazepines, midazolam, which often causes sedation, amnesia and anxiolysis without prolonging postoperative awakening.

Day case surgery requires the highest anaesthetic standards but there is no general agreement on the most suitable anaesthetic technique. Various techniques have been used.

In ambulatory anaesthesia one of four types of anaesthesia is applied:

- general anaesthesia,
- regional anaesthesia,
- combination of local anaesthesia and intravenous sedation,
- local anaesthesia.

Successful anaesthesia for DCS requires a balanced anaesthetic technique and multidisciplinary input.

After induction of anaesthesia with intravenous anaesthetics, anaesthesia is performed by a combination of different drugs that induce hypnosis, amnesia, analgesia, muscle relaxation and haemodynamic stability.

Anaesthetics used in balanced anaesthesia are intravenous anaesthetics (propofol, etomidate), inhaled anaesthetics (isoflurane, sevoflurane, desflurane), opioid analgesics (fentanyl, remifentanyl, alfentanyl, sufentanyl), muscle relaxans (atracurium, rocuronium, mivacurium) and other drugs (benzodiazepines, antiemetics). In the past mask was used for the short outpatient operations, and now days application of laryngeal mask (LM) is increasingly in usage, due to its simple set up, and benefits such as: reduction in the incidence of postoperative dry throat, avoidance of acute haemodynamic changes during installation, no need for muscle relaxation, and the anaesthesiologist has a free hand.

Laryngeal mask airway does not ensure, with active vomiting, aspiration of gastric contents *(1, 2, 6)*.

In DCS regional anaesthesia is used, central and peripheral blocks are commonly used.

Central neuroaxial blocks in DCS are:

- spinal anaesthesia,
- unilateral spinal anaesthesia,
- epidural anaesthesia,
- caudal epidural anaesthesia,
- paravertebral anaesthesia.

Spinal anaesthesia

Spinal anaesthesia is safe anaesthetic technique, it has rapid onset and, more important, rapid offset of motor action. The mechanism of action of spinal anaesthesia is partly explained by a sodium channel block. Other mechanisms of its action include blocking of neural calcium channels, inhibition of potassium channels, modulation of the action of neurotransmitters, and disruption of coding of electrical information.

Side effects of spinal anaesthesia are:

- **Post spinal headache** occurs in up to 1% of the patients and is usually occurs when spinal needle are thicker than of 27 gauge *(7)*.
- **Neurologic injury – transient neurological symptoms (TNS)** are the symptoms that do not occur until 6–12 hours after spinal blockade. They present as transient back pain radiating into the legs commonly associated with the application of lidocain (33–37%), rare with bupivacaine, levobupivacaine or ropivacaine (0–3%) *(8, 9)*.
- **Cauda eqina syndrome** occurs as a transient lesion that is associated with loss of sensation in perineal region with consequent retention of urine and feces. It is often associated with giving large doses of lidocaine *(8, 9)*.
- **Pruritus** is a problem with upload adjunct to spinal anaesthesia and incidence varies between 25% and 75%. Droperidol, propofol and alizapride reduced the incidence of pruritus. Promethasine in dosage of 50 mg is shown to be ineffective for the reduction of pruritus *(10)*.
- **Postoperative nausea and vomiting (PONV**) are significant problem in the ambulatory surgical setting. PONV result in delayed discharge, increased cost, and decreased patient satisfaction. Ondasteron, dexamethasone and droperidol reduce the risk of PONV about 26% *(11)*.

- **Urinary retention** occurs with long – acting and intermediate – acting local anaestetics. Short-acting local anaestetics have minor effect on urinary retention *(12)*.

Unilateral spinal anaesthesia

Unilateral spinal anaesthesia means one-sided block with an absence of sensory and motor block on the non-operative side. Position of the patient is lateral side during 15 to 20 minutes. Unilateral block-reduces doses of long-acting agnts whereas the use of short-acting agents is recommended. The cardiovascular stability is one of the most important benefits, especially in patients with heart disease. Hypotension may develop in 0–6% patients while in bilateral spinal anaesthesia usually occurs in 30% of the patients. Patient satisfaction with unilateral spinal anaesthesia is between 90% and 99%. Combining intrathecal opioid with local anaesthetic, using unilateral technique and manipulating the position of the vertebral column at the time of injection to a head-down position might be beneficial for achieving a higher sensory block without the need to increase the dose of local anaesthetic and delay home discharge *(13)*.

Epidural anaesthesia

Epidural anaesthesia has a very limited role in day surgery. It provides a greater flexibility in case of prolonged surgery and postoperative pain treatment. For ambulatory procedures epidural anaesthesia consumes more time compared with other central neuraxial blocks *(14)*.

Caudal epidural anaesthesia

Caudal epidural anaesthesia is the most commonly used regional anaesthesia in children *(15)*.

Combined spinal-epidural (CSE) anaesthesia

Combined spinal-epidural (CSE) technique reduces local anaesthetic doses to reduce motor block and »walk--in, walk-out« spinals for ambulatory surgery.

Paravertebral anaesthesia

Paravertebral anaesthesia is also used in ambulatory anaesthesia. Paravertebral anaesthesia is an alternative to unilateral epidural anaesthesia with prolonged postoperative pain elimination.

Peripheral nerve blocks in daily surgery

The most common peripheral nerve blocks used for the upper extremities are:

- brachial plexus block,
- intravenous regional anaesthesia (Bier block),
- radial block,
- ulnar block.

TABLE 1

Discharge Scoring Systems the aldrete scoring system postanaesthesia discharge scoring system – PADSS.

The Aldrete Scoring System	The Post Anaesthetic Discharge Scoring System (PADSS)
Respiration	Vital signs
Able to take deep breath and cough = 2	BP & pulse within 20% preop = 2
Dyspnea/shallow breathing = 1	BP & pulse within 20–40% preop = 1
Apnea = 0	BP & pulse within >40% preop = 0
O_2 saturation	Activity
Maintains >92% on room air = 2	Steady gait, no dizziness or meets preop level = 2
Needs O_2 inhalation to maintain O_2 saturation >90% = 1	Requires assistance = 1 Unable to ambulate = 0
O_2 saturation >90% even with supplemental oxygen = 0	Nausea & vomiting Minimal/treated with p.o. medication = 2
Consciousness	Moderate/treated with parenteral medication = 1
Fully awake = 2	Severe/continues despite treatment = 0
Arousable on calling = 1	Pain
Not responding = 0	Controlled with oral analgesics and acceptable to patient:
Circulation	Yes = 2
BP ± 20 mm Hg preop = 2	No = 1
BP ± 20–50 mm Hg preop = 1	Surgical bleeding
BP ± 50 mm Hg preop = 0	Minimal/no dressing changes = 2
Activity	Moderate/up to two dressing changes required = 1
Able to move 4 extremities = 2	Severe/more than three dressing changes required = 0
Able to move 2 extremities = 1	
Able to move 0 extremities = 0	
Max.=10	

The most common peripheral nerve blocks used for the lower extremities are: – spinal block, – unilateral spinal block, – intraarticular block, – peroneal block.

Choice of local anaesthetic for different surgical procedures is crucial to achieve good operative and postoperative analgesia with a minimum side effects. Hyperbaric solutions of local anaesthetics appear to produce more consistent results that plain solutions in central neuraxial and peripheral blocks and the addition of other drugs.

Bupivacaine, levobupivacaine and ropivacaine are widely used, often with adjuvants such as morphine, fentanyl, sufentanyl (preservative free opioids), clonidine, S (+) ketamine, adrenalin, neostigmin and naloxon to improve analgesia, and reduce side effects *(16, 17)*.

Discharge criteria

Patients should have stable vital signs, be alert and orientated, be comfortable and pain free, be able to walk, be able to tolerate oral fluids, have minimun nausea and vomiting. Patients should be provided with information sheets, and should be provided with contact telephone numbers.

Routine use of special scoring systems [Aldrete, PADSS (postanaesthesia discharge scoring system)] are proven helpful and therefore recommended (Table 1) *(18, 19)*.

Pain and emesis should be properly controlled and analgesic or antiemetic regime prescribed.

Pain and PONV are the most common causes for a patient to require unplanned admission. Effective postoperative pain management begins preoperatively. Preemptive analgesia giving analgesia before the noxious stimulus is more effective than giving the same analgesia after the stimulus.

Multimodal analgesia implies the use of several analgesics or modalities that act by different mechanisms in combination to maximise analgetic efficacy and minimise side effects. This strategy allows the total doses and side effects of analgesics be reduced *(20)*.

CONCLUSION

The key to successful ambulatory anaesthesia involves the appropriate selection of patients and operations, psychological and pharmacological preparation, the best perioperative anaesthetic treatment and careful monitoring of patients after discharge.

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