

Sharing Responsibility Does Not Always Make Things Easier

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Positioning of the patient on the operating table is supposed to be a simple task for the operating room team (surgeon, anesthesiologist, circulating nurse and their aids): once anesthesia induction is performed, in the vast majority of cases in the supine position, and surgical procedure is known, it is simple to decide upon the position the patient during operation.

The main factor for deciding upon the position on the operating table is the need to assure an easy surgical access to the anatomic location of the procedure.

But positioning is sometimes accompanied by complications and most of them are related to nerve injuries. About 15% of anesthetic malpractice claims in the USA refer to nerve injury during operation [1].

There are two main problems related to nerve injuries during surgery and anesthesia.

First is the fact that in most cases the anesthetized patient is unable to complain about pressure or lack of comfort on his or her limbs.

But the worrying aspect of nerve injury during surgery is that it may occur even when all the precautions have been taken and the impression is that nothing has been left in order to assure a smooth surgical and anesthetic act.

This reality does not imply that nothing or almost nothing is to be done in order to prevent this kind of complications. On the contrary, the clinician has to be sure that he followed all the recommendations and guidelines related to prevention of nerve injury and, in case of an injury, he/she must be ready to prove that all the necessary measures have been taken for every single case.

Needless to say, if negligence could be proved, nobody can defend the surgical team, even if it is true that not always the mechanism of injury is clear and easy to demonstrate.

The case

Most of the cases published in the literature refer to brachial plexus and ulnar nerve injuries.

Our case is a different one and deals with the injury of the radial nerve.

The patient was a 67 years old man, diagnosed of having a pyloric obstruction due to an old duodenal ulcer. He was known as a heavy smoker, mild obese (BMI 31) and moderately hypertensive.

On a morning of December 2004 the patient was brought to the operating room for a duodenogastroplasty procedure.

A saline infusion was placed on a large vein on the left hand, diazepam 2 mg i-v injected and the patient was positioned on the operating table. He was laid supine with his both arms 90 degrees abducted and fixed on arm boards. A non-invasive blood pressure large-adult cuff was placed on the right arm and blood pressure was automatically measured every ten minutes.

The induction of anesthesia was done with propofol-esmeron, tracheal intubation performed without any difficulty and anesthesia was maintained with isoflurane, N₂O, fentanyl and esmeron. The metallic vertical bar, separating the surgical field from the patient's head and neck was also covered by sterile sheets.

The surgical procedure lasted 80 minutes and was completely uneventful. According to anesthesia chart recording the surgeons asked for a head-down position twice during the operation, each time around 15 minutes.

At the end of the procedure the patient was transferred to the recovery room and he soon he became alert.

Once completely recovered, he complained of significant difficulty to raise his right hand and also of paresthesias on the dorsal side of his right forearm.

A neurologist was asked to see the patient and since radial nerve palsy was suspected, a neck CT scan, an electromyography (EMG) and conductivity studies were performed in the same afternoon. The result of the CT scan was normal, but the analysis of the EMG evidenced a severe delay in the impulse nerve transmission, compatible with right radial palsy, with injury above the elbow level.

During the next months the patient got physiotherapy and special physical exercises in order to ameliorate the condition of his right arm, but with no clear effects. His complains included a visible muscle weakness of the arm, hypoanalgesia and also paresthesias at the level of the dorsum of the right forearm and hand.

The proposal for a surgical procedure, radial nerve neurolysis, was refused by the patient since he was explained that the chances of success could be below 50%.

A neurological examination at one year after the event did not find almost any improvement in the forearm and hand condition and a 71% degree of invalidity was established by the special committee appointed by the Social Security services.

Some two years after surgery a complain against the hospital and the anesthesiologist who was in charge with

the patient was sent to a regional court and the case was scheduled for trial.

The plaintiff expert opinion

The expert, a well known specialist in Anesthesiology for 25 years and a senior lecturer at one of the country medical schools, presented in writing her views regarding the case. She decided to discuss two aspects of the problem:

1. What was the causal factor of the radial nerve injury?
2. How, if at all, could the injury be prevented?

The expert presented data from literature and established a possible double etiology of the radial injury: the blood pressure cuff and the vertical bar of the operating table [2].

Since the cuff could be incriminated only in case of prolonged periods of excessively frequent cuff inflation/deflation cycling and no data could prove this etiology, the expert considered this factor as highly improbable.

The pressure of the vertical bar could be the causative factor of the injury, since it usually happens as a result of the fact that one of the surgeons (and there were four surgeons taking part to that operation) could push the bar onward with his body. This usually happens during surgery done on the supramesocolic region of the abdomen, when the position of the surgeons becomes problematic since the place around the operating table is rather narrow.

This etiology is known in the literature and the expert mentioned the fact that a classical paper published in 1964 [3] reported a case of radial nerve paralysis caused by pressure applied to the lateral side of the upper limb by a vertical bar of the anesthesia screen.

A very well known textbook [4] adds another explanation to this situation: during Trendelenburg position the arm tends to be pushed up against the vertical screen, squeezing the nerve between the screen and the spiral groove of the humerus. In this situation the radial nerve is pinched and injured by an ischemic effect of continuous pressure.

Once the etiology of the injury could be explained the expert focused on the question about the prevention of this complication.

She based her expertise on the conclusions of the Task Force Consensus Conference, appointed by the American Society of Anesthesiologists – ASA [5]. In this document the conference participants summarized that “prolonged pressure on the radial nerve in the spiral groove of the humerus should be avoided”, since the radial nerve is susceptible to compression injury as it passes dorsolaterally around the middle and lower thirds of the humerus in the musculospiral groove.

The expert also found out that the anesthesia chart did not mark the arms position during surgery, and this was contrary to the opinion of specialists as expressed in the same document of ASA Task Force. That group of experts established that “charting specific positioning actions during the care of the patients may result in improvements of care by helping the practitioners focus attention on

relevant aspects of patient positioning and also providing information that continuous improvement processes can lead to refinements in patient care”.

The expert of the plaintiff side concluded that the anesthesiologist in charge with the patient did not prove that he took all the necessary measures in order to prevent the complication. He did not pay attention to the patient’s arm position during surgery, did not avoid the pressure on the radial nerve and, by not mentioning the arms position in the anesthesia chart did not prove that he was aware of the possible complications arising from the patient position on the operating table.

The opinion of the defendant’s expert

The defendant expert was a director of an anesthesia department in one of the hospitals in the north of Israel, a well known specialist in Anesthesiology, with a large experience in the field of medicolegal aspects of his profession.

In his expertise he mentioned the fact that there is no clear explanation of the radial nerve injury during anesthesia and surgery and this for the simple fact that radial injury is a very rare complication of patient positioning on the operating table.

Since there is no certitude regarding the mechanism of radial injury, it would be difficult, wrote the expert, to accuse the anesthesiologist for not being aware of this possible complication and for not having taking care to prevent it.

He quoted the already mentioned paper [4] which stated that no studies have been performed in order to explain the mechanisms of radial injury and the necessary strategy to prevent it.

More than this, he mentioned the fact that some patients might suffer from a genetic subclinical neuropathy, which might become evident after a prolonged unchanged position, as it happens in the operating room.

The expert brought up a report published in the year of 2003 of a case of radial nerve paralysis due to a retractor used for an upper abdominal operation and he raised the question if the case discussed in court had the same etiology. In that case, already reported in the literature [6], the self retractor’s supporting column was fixed on the table rail 5 cm above the elbow joint, the exact region where the injury was produced in the current case.

The defendant’s expert concluded that no negligence could be proved in the case in discussion, that a long list of etiologic (but not proved) factors could be incriminated in this case and possible measures to prevent this complication are highly controversial.

The court decision

The judge decided not to call for a new expertise, to be offered by an expert not direct related to any of the sides.

He called for an outside the court agreement and asked for a final answer of both sides in less than three months. The sides agreed for a certain amount of money to be of-

ferred to the patient by the hospital's insurance company and the case was taken out from the court agenda.

Final comments

The above case brings to the attention of the reader a real situation in which the clinician could be involved in a trial for a possible negligence during routine care of a patient.

The anesthesiologist in charge with the patient was not aware of the possibility of a nerve injury during anesthesia and surgery and this is the explanation for the fact that the anesthesia chart lacked important information such as patient's arms position during the procedure. This fact could be considered a proof of negligence and of a lack of consideration for a possible nerve injury.

In the same time the court became aware of the fact that very often the cause of radial nerve injury during surgery and anesthesia is difficult to prove, in spite of the fact that professional negligence could be easily incriminated.

One thing was clear and above any controversy: the patient suffered a nerve injury and the invalidity due to this injury became permanent. In this situation the compromise proposed by the judge was clear: the plaintiff would give up the complain of negligence and the defendant would have to accept the responsibility for the damage produced during the surgical procedure.

But above any controversy regarding negligence here is the place to mention the fact that positioning on the operating table is sometime a factor of risk for the patient and that this part of the surgical activity must be in the attention of all the surgical team.

The circulating nurse has to be sure that the patient feels comfortable on the operating table. The anesthesiologist's task is to cover all the sensible body areas which might be exposed to pressure or compression. The surgeon must check the position of the patient and be sure that all the preventive measures have been taken in order to avoid this very unpleasant complication.

The solution to this aspect of routine surgical activity is the creation in each hospital of a specific protocol to be fol-

lowed in each case in which the patient might be in jeopardy for a peripheral nerve injury during anesthesia and surgery.

For our readers:

As per our initial intention, expressed with the occasion of opening the medico-legal rubric in this important journal, we would like to ask our readers to answer the following questions:

1. Do you think that the surgical team took all the preventive measures in the above case in order to prevent peripheral nerve injury?
2. How important is, from the medico-legal point of view the precise recording in the anesthesia chart of the patient's position on the operating table, with the aim of preventing further complaints?
3. Who is responsible for the correct patient's positioning on the operating table? The anesthesiologist, the surgeon, the circulating nurse? Do you consider this a surgical team responsibility?

The editor will be happy to get your opinions and to comment them in further issues of this journal.

References

1. Engel TP. Positioning. In „Adult perioperative anesthesia”. Eds Cole DJ and Schlunt M. Elsevier Mosby, 2004 pp 96
2. Warner MA. Patient positioning. In „Clinical anesthesia”. Eds Barash PG, Cullen BF and Stoelting RK. Lippincott Williams and Wilkins, 2006 5th ed. pp 650
3. Britt BA, Gordon RA. Peripheral nerve injury associated with anesthesia. *Can Anaesth Soc J* 1964;11:514
4. Britt BA et al. Anesthesia-related trauma caused by patient malpositioning. In „Complications in Anesthesiology” Eds Gravenstein N and Kirby RR. Lippincott-Raven, 1996 2nd ed pp 371
5. *** Practice advisory for the prevention of perioperative peripheral neuropathies: a report by the American Society of Anesthesiologists Task Force on Prevention of Perioperative Peripheral Neuropathies. *Anesthesiology* 2000;92:1168-1182
6. Lee HC et al Radial nerve paralysis due to Kent retractor during upper abdominal operation. *Yonsey Med J* 2003;6:1106