



# Abducens Nerve Paralysis Following Spinal Anesthesia

## Spinal Anesteziyi Takiben Gelişen Abdusens Sinir Paralizisi

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Among the complications of spinal anaesthesia, 6<sup>th</sup> cranial nerve palsy occurs rarely. There is a possibility of encountering nerve injury during subarachnoid injections due to a long extracranial course. The symptoms appear as a result of ocular muscle paralysis. These symptoms often begin after the 4<sup>th</sup> day and spontaneous recovery lasts for weeks to months. We present a case in which Nervous Abducens palsy occurred following spinal anaesthesia for double j ureteral catheter placement surgery.

**Key Words:** Abducens nerve, spinal anaesthesia, diplopia, double j stent, complication

Spinal anestezinin komplikasyonları arasında 6. sinir paralizisi ender görülmektedir. Sinirin ekstrakraniyal uzun seyri nedeniyle subaraknoid enjeksiyonlar sırasında hasarlanma ihtimali bulunmaktadır. Sıklıkla 4. günden sonra ortaya çıkan semptomlar oküler kas paralizisi sonucunda belirmektedir ve haftalar ila aylar içerisinde spontan olarak gerilemektedir. "Double j üreter kateterizasyonu" operasyonu için spinal anestezi uygulanan ve ardından abducens sinir paralizisi gelişen olgumuzu sunmaktayız

**Anahtar Kelimeler:** Abdusens siniri, spinal anestezi, diplopi, double j kateteri, komplikasyon

### Introduction

Spinal anaesthesia is typically used in several urological surgeries (1). There are many reasons for preferring spinal anaesthesia to general anaesthesia. Firstly, regional anaesthesia offers advantages that include relative cheapness, patient satisfaction, reduced risk of respiratory complications, less bleeding, superior muscle relaxation, rapid restoration of bowel function and reduced incidence of coagulation disorders following surgery. The procedure is simple, duration of hospital stay is shorter, and incidence of postoperative wound infection is less (2). Spinal anaesthesia is also popular for endoscopic urological surgery because of early recognition of symptoms caused by overhydration, transurethral resection of prostate syndrome or bladder perforation. Urethral stents have been successfully used for providing internal drainage since 1967 (3). Treatment of urolithiasis, genitourinary trauma, oncologic and reconstructive surgery are the main designated areas (4, 5). Nervous Abducens paralysis rarely occurs following spinal anaesthesia. Headache and diplopia accompanied by the 6<sup>th</sup> nervous paralysis developing after spinal anaesthesia is seen in 0.012% to 0.020% of all blockages (6). Third (Oculomotor Nerve), 4<sup>th</sup> (Trochlear Nerve), 7<sup>th</sup> (Facial Nerve) and 8<sup>th</sup> (Vestibulocochlear Nerve) cranial nerve paralyse are quite rare, while 5<sup>th</sup> (Trigeminal Nerve) nerve paralysis is more uncommon than the others (7). Sixth nerve (Abducens nerve) paralysis developing after spinal anaesthesia was first defined by Hayman and Wood in 1942 (8). Nervous Abducens, a pure motor nerve, pulls the eyeball laterally by innervating the musculus rectus externus. With paralysis of the musculus rectus lateralis, the eyeball cannot move laterally. The patient's head is turned towards the paralyzed side. The patients with paralysis of ocular motor nerves; N. Oculomotorius, N. Trochlearis and N. Abducens complain of diplopia, headache, fever, focal weakness and numbness; loss of taste and hearing may accompany these symptoms. We present a case in which Nervous Abducens palsy occurred following spinal anaesthesia for double j ureteral catheter placement surgery.

### Case Report

A 28 year old, female patient with the diagnosis of kidney failure was admitted to the urology clinic. Preoperatively the patient was informed about spinal anaesthesia for ureteral double j catheterisation procedure. She had no neurological deficiency before the surgical procedure. The spinal anaesthesia was applied from the Lumbar 4-5<sup>th</sup> intervertebral area utilizing the sitting position and a 26 Gauge Atrocane needle. Through the needle, 12.5 mg hyperbaric bupivacaine with 20 mcg fentanyl was injected. There were no complications during the blockade and the urological operation. Neurologic, hemodynamic and vital parameters were all within normal ranges. The operation time was 25 minutes. On the 2<sup>nd</sup> postoperative day an occipitofrontal headache began. This was characterised as a postdural puncture headache and nonsteroidal anti-inflammatory drugs, oral hydration and caffeine were administered. Her complaints were reduced in the following days, then left eye abduction deformity and diplopia was manifested in the 5<sup>th</sup> postoperative day (Fig. 1). Sixth cranial nerve injury was determined by ophthalmology consultation. Intracranial mass and infection were eliminated by cranial magnetic resonance imaging (MRI). Oral steroid treatment was initiated at a dose of 40 mg per day. The symptoms were diminished by the end of the 1<sup>st</sup> month and she was able to work unassisted at the end of the 2<sup>nd</sup> month (Fig. 2).

Table 1. Neurological examination findings

Systems	Findings
Cranial Nerves	Diplopia
Mental Status Examination	Normal
Sensory System	Normal
Extrapyramidal System	Normal
Pyramidal System	Normal
Cerebellum	Normal
Peripheral Nervous System	Normal
Individual Muscle Testing	Normal
Evaluation of Speech and Language	Normal



Figure 1. Sixth nerve paralysis after spinal surgery



Figure 2. Healing after treatment

## Discussion

Nervous Abducens passes into the subarachnoid space by leaving the pedunculus at the pontomedullary junction and heads towards the clivus vertically (9). Nervous Abducens paralysis is the most common type of all cranial nerve paralysis because of its long and curly shape (10, 11). As this complication is reversible, there is no need to choose general anaesthesia instead of spinal blockage. However, the use of pencil point spinal needles may be increased for preventing postdural puncture headache. Isolated paralysis of N. Abducens may be seen in both pons lesions and high intracranial pressure circumstances (12, 13). Haemorrhages, infectious diseases, sarcoidosis and infiltrations such as leukaemia and lymphoma also cause 6<sup>th</sup> cranial nerve paralysis. Follow up therapy is recommended in focal paralysis. Steroids are effective by reducing the neuronal oedema. In addition to MRI, cerebrospinal fluid sample analysis is essential when other neurological symptoms accompany 6<sup>th</sup> nerve paralysis (14, 15). Differential diagnosis should be reviewed if the symptoms persist. Therefore we have obtained MRI in spite of regression of the symptoms. On the other hand, Nervous Abducens paralysis may occur as a complication of epidural anaesthesia (16). Much the same as the case report of Vial et al. (17), regression of symptoms might take up to eight months. Sometimes, 4<sup>th</sup> cranial nerve palsy accompanies 6<sup>th</sup> nerve palsy, as reported in the case of King et al. (18) On account of this, it must always be remembered that cranial nerve palsies may not occur alone. Intracranial subdural hematoma and cerebellar haemorrhage has been reported previously as a rare complication of spinal anaesthesia (19, 20).

Merino et al. (21) described the causes and treatment of sixth cranial nerve palsy in a series of paediatric patients under 14 years of age, and neoplasms were the most frequent cause for their occurrence. Double vision may arise from ocular, neurologic, or extra ocular muscle disorders (22). Intracranial hypotension, infection or myasthenia gravis must be included in the differential diagnosis of diplopia.

## Conclusion

Nervous Abducens paralysis is the most common type of all cranial nerve paralysis because of its long and curly shape. Intracranial complications of spinal anaesthesia are quite rare, but as the use of spinal anaesthesia in urological procedures is common, it must be recognised.

## Conflict of Interest

No conflict of interest was declared by the authors.

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