Sixth Nerve Palsy

Nerve function
The abducens nerve supplies the lateral rectus muscle and is responsible for abduction of the eye. In a sixth nerve palsy, the patient experiences double vision, worse on looking towards the side of the lesion and with the images parallel to each other (not tilted as in a fourth nerve palsy).

Examination of the eye
Inspection
Visual acuity
Visual fields
External ocular movements
Fundus
Pupils

Examining external ocular movements
There may be an obvious strabismus (squint) at rest, but sometimes the changes are subtle as the palsy is incomplete. If there is a squint, the eye will appear to be turned inwards (internal strabismus) because of the unopposed action of the medial rectus (supplied by the 3rd nerve).

The key instruction is
“Follow my finger with your eyes and *tell me if you see double*”
Rule One: *when the images are maximally separated, that is the direction of pull of the weak muscle*

With a sixth nerve palsy, this will be looking to the side. Conjugate lateral gaze depends on co-ordination of the lateral rectus of one eye with the medial rectus of the other. So if the weak side is not obvious, it must be remembered that such double vision *could* be due to weakness of either the lateral rectus of one eye or of the medial rectus of the other (contralateral to the side of the maximal diplopia).

**Rule Two:** *the lateral image is the false image*

This sorts out which eye is at fault

By covering each eye in turn, the examiner can discover from which eye the false lateral image arises and hence distinguish which of the pair of muscles is at fault eg left lateral rectus and right medial rectus.

**Course of the sixth nerve**

The nucleus is in the lower pons.

The nerve exits anteriorly and travels up the brainstem on either side of the basilar artery, in the subarachnoid space (here it is susceptible to meningitis and rarely basilar aneurysms).

It passes forward over the base of the skull towards the tip of the petrous temporal bone (here it can be damaged by severe ear infections associated with bone infections-osteomyelitis- as well as by skull fractures and by nasopharyngeal cancer).

It enters the cavernous sinus and then goes through the superior orbital fissure to reach the eye.

**Causes of sixth nerve palsy**

Idiopathic

Trauma with skull fracture

Diabetes (small vessel disease affecting the vasa nervorum)

Demyelinating disease (multiple sclerosis)

Nasopharyngeal carcinoma (at the skull base)

Basilar artery aneurysms (rare)

Meningitis (rare)