

Case Report

Deterioration of Pre-Existing Hemiparesis Following an Ipsilateral Corona Radiata Infarct: A Rare Entity

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Abstract

Stroke presenting as contralateral hemiparesis is predominantly related to contralateral projection of the corticospinal tract. While most corticospinal fibers decussate at the level of the medulla, some tracts continue to descend as ipsilateral anterior corticospinal fibers. The anterior corticospinal tract (CST) has been suggested as one of the ipsilateral motor pathways which contribute to motor recovery following stroke. Few case reports in literature show ipsilateral hemiparesis due to involvement of anterior corticospinal fibers. We are reporting a case who showed deterioration of pre-existing hemiparesis due to involvement of the ipsilateral anterior CST following a corona radiata infarct.

Keywords: Hemiparesis; Ipsilateral; Anterior corticospinal tract

Introduction

Supratentorial stroke commonly results in neurological weakness on the contralateral side of the body. The reason for this is the predominance of contralateral corticospinal projections which arise from the cortical regions of the brain and decussate in the caudal medulla [1]. While not all fibers decussate, 70–90% of them cross, resulting in this ‘crossed’ hemiparesis [2]. The CST is generally divided into the crossed lateral CST and the uncrossed anterior CST. The anterior CST is considered to be one of the ipsilateral motor pathways from the unaffected motor cortex to the affected extremities, which contribute to motor recovery following stroke incidents [3]. There are few case reports of ipsilateral hemiparesis due to affection of uncrossed fibers. We are reporting a case who showed deterioration of pre-existing hemiparesis due to involvement of the ipsilateral anterior CST following a corona radiata infarct.

Case Presentation

A 58-year-old right handed male, known case of hypertension, diabetes mellitus and old stroke- 3 years back in the form of left hemiparesis with residual deficit (MRC grade power 3/5) and residual left facial weakness, developed sudden deterioration in left hemiparesis including facial weakness. On neurological examination, he had left upper and lower limb weakness with MRC grade 0/5. DTR

were brisk on left side with extensor plantar. MRI brain DWI showed an area of restricted diffusion in the left corona radiata representing acute infarct (Figure 1). There was an old infarct in the right fronto-parietal region (Figure 2). A 2-D echocardiogram and carotid Doppler study was normal. CT angiography brain and neck vessels were normal (Figure 3). Diffusion tensor tractography (DTT) could not be done due to non-availability. Patient was discharged on conservative treatment as well as physiotherapy and recovering in follow up.

Discussion

Ipsilateral hemiparesis after a supratentorial cerebral stroke has rarely been reported. There are only few case reports in literature in which ipsilateral hemiparesis occurred due to stroke involving uncrossed anterior CST (Table 1).

We evaluated a left hemiparetic patient with a new left corona radiata infarct and an old right middle cerebral artery infarct. Before the onset of the new left corona radiata infarct, the patient was able to do his daily routine activities with mild discomfort. However, after the onset of the new infarct in the left corona radiata, the motor function of his left extremities deteriorated to complete weakness (MRC grade 0/5). We presumed that some neural tract other than the right whole CST had been responsible for the partial motor function (MRC grade 3/5) of the left extremities before the onset of new left corona radiata

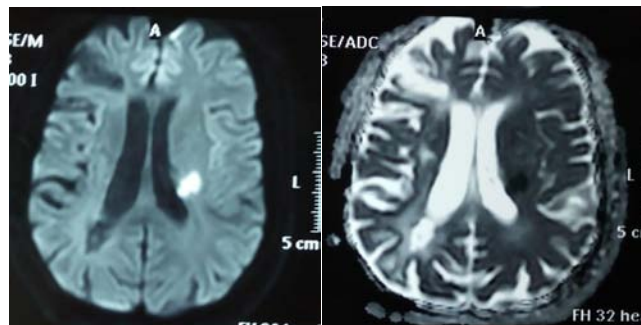


Figure 1: MRI DWI & corresponding ADC image showing acute infarct in left corona radiata and remote infarct in right fronto - parietal cortex.

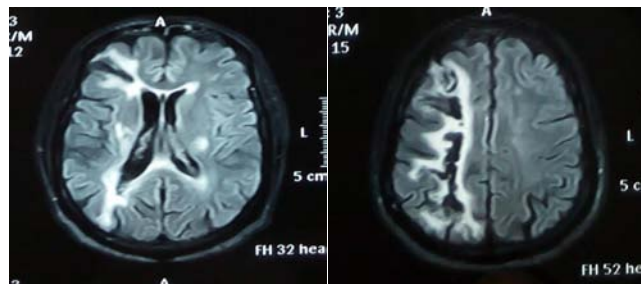


Figure 2: MRI T2 FLAIR image showing remote infarct in right fronto-parietal cortex and acute infarct in left corona radiata.



Figure 3: Normal CT Angiography of brain & neck vessels.

Table 1: Summary of previous case reports.

Authors	No.of cases	Age	Sex	Hemiparesis	Dominant hemisphere	Type of stroke	Location	Confirmatory imaging	DTT
[4]	1	55	M	R	L	IS	CR	MRI	-
[5]	1	62	M	R	L	ICH	Putamen	CT	-
[6]	1	-	-	R	L	ICH	IC and thalamus	CT	-
[7]	2	62 41	F M	L R	L L	IS IS	CR CR	MRI, Fmri MRI	-
[8]	1	59	M	L	L	IS	CR	fMRI	-
[9]	1	55	M	L	L	IS	CR and putamen	MRI	Yes
[10]	1	35	M	R	L	IS	IC	MRI	-
[11]	2	57 67	M F	L R	L L	IS IS	O,P,F F	MRI MRI	-

L = Left, R=Right, IS= Ischemic Stroke, ICH= Intracerebral Hemorrhage, IC= Internal Capsule, CR=Corona Radiate, DTT= Diffusion Tensor Imaging Tractography, O=Occipital, P= Parietal, F=Frontal

infarct. Considering that the new infarct involved anterior CST area of the left corona radiata, the left anterior CST appeared to be the most plausible motor tract for deterioration of pre-existing left hemiparesis.

Diffusion tensor tractography (DTT) can visualize the neural tracts in three dimensions, so DTT should be used for confirmation of anterior CST as used by Ng, et al. [9]. Absence of proof by DTT is the limitation of our case report as this modality is not available to us.

Association of ipsilateral hemiparesis with cerebral malformations, such as posterior fossa malformations, occipital encephalocele, Dandy-Walker malformation, Joubert syndrome, and Moebius syndrome was not found in our case as described in literature [12,13], however findings in our case are consistent with

higher incidence of ipsilateral hemiparesis in right handed person and in those with past history of stroke as in literature [6,11] .

Conclusion

Our case report suggests that the new infarct in the left corona radiata damaged the uncrossed ipsilateral motor pathway, which had been responsible for the motor function of the left extremities after remote infarct, causing further deterioration of the pre-existing hemiparesis. Our observation favours previous case reports that ipsilateral hemiparesis is common in right handed males with past history of stroke; however malformation of the brain was not found in our case which were detected earlier in the literature.

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