

# Optic Tract Gliomas Treatment Strategy: Dept of Neurosurgery Khoula Hospital Muscat Experience: A Review

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**Abstract:** Optic tract gliomas are a well known entity mainly in pediatric age group. Patient's presentation is mainly visual deterioration. MRI is the gold standard for diagnosis and treatment planning. Treatment varies from observation to biopsy to complete excision. Outcome to the visual improvement is guarded. We present here our experience of optic tract gliomas in Dept of Neurosurgery Khoula hospital Muscat Oman with various treatment strategies adopted by different units and outcome thereof.

**Keywords:** optic tract gliomas.

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## 1. INTRODUCTION

An optic tract glioma or visual pathway glioma is a slow growing brain tumour in and around optic tracts making 2% of all cerebral gliomas. As the tumour increases in size vision gradually worsens and blindness can occur. These tumours are seen mainly in 5 to 10 yrs of age group. Their association with patients of neurofibromatosis is well known. As pituitary and hypothalamus are in close proximity endocrine function can be disturbed say hormone production, salt and water balance, appetite and sleep. 25 to 35% involve anterior optic pathways and rest involve optic chiasma and tracts. Treatment involves confirmation of diagnosis by imaging say MRI and then either observation, or biopsy or surgical excision is planned<sup>1</sup>. These lesions are also known to respond to radiotherapy as well. Recurrence is well known after complete excision in patient with NF1. However routine screening for optic glioma in NF1 patients with MRI is still not considered.

## 2. MATERIAL AND METHODS

From our records we could retrospectively analyze 13 patients with visual pathways gliomas. Details are as per table shown below.

S. No	IP no	Age /sex	Presentation	Investigation	surgery	Complications	HPE	Follow up
1	839503	16yrs/F	Impaired vision	MRI chiasmatic glioma	Supra orbital eye brow incision approach	nil	Low grade glioma(pilocytic astrocytoma)	1yr
2	872015	2 yrs /m	Proptosis right ye	MRI brain Optic nerve tumour intraorbital	Kept under observation/chemo referral	Nil	NA	Awaited
3	777515	5yrs/m	Nystagmus	MRI bilateral visual pathway glioma with NF1	Kept under follow up /chemo referral given	nil	NA	4 yrs follow up Optd for intracranial arachnoid cyst
4	883128	11yrs /f	Proptosis & decreased vision	MRI left optic Intera and extra orbital	Craniotomy and excision	nil	Pilocytic astrocytoma grade 1	1 yr follow up
5	667695	2yrs /m	Impaired vision and squint	MRI chiasmal /hypothalamic glioma	Supraorbital Craniotomy in 2010	nil	Pilocytic astrocytoma	Lost to follow up
6	745197	13 yrs/M	Squint & impaired vision	MRI left optic nerve chiasmal glioma	Craniotomy and excision	nil	Pilocytic astrocytoma	4 yrs f/u
7	708052	28 yrs /f	Loss of vision & headache	MRI optic chiasmal glioma and nerve	Went abroad GKS in Pakistan	NA	NA	1 yr f/u
8	676564	11 yrs /f	NF1 with routine screening pick up	MRI left optic nerve glioma	On follow up	NA	NA	1 yr f/u
9	245479	39 yrs/f	Left eye loss of vision with NF1	MRI left optic nerve glioma	Craniotomy and decompression	nil	Low grade glioma	10 yrs f/u
10	329164	25 yrs /f	Impaired vision with squint	MRI optic pathway lesion	Craniotomy and decompression and post op radiotherapy	nil	Low grade glioma	14 yrs f/u
11	394292	63 yr/f	Visual loss starting right eye	MRI chiasmal glioma extending to optic radiation	Craniotomy and d compression	nil	Glioblastoma	2 yrs f/u
12	868468	10 yr/f	Headache and blurring of vision	MRI chiasmal hypothalamic glioma	Multiple e craniotomies and trans sphenoidal decompression with	Patient ventilator dependent with GCS E4M3 Vt	Pilocytic astrocytoma	2 yrs still admitted in ICU
13	908010	3 yr/f	Loss of weight, appetite and ataxic gait	MRI suprasellar hypothalamic chiasmal sol	Craniotomy and excision with VP shunt	Patient ventilator dependent with GCS E4M4Vt	Pilocytic astrocytoma	1/2yr still admitted in ICU

In our series 4 patients were male and 9 were females. Youngest patient was 2 yrs old and eldest was 63 yrs old. Two patients were having NF1, Presentation ranged from proptosis to vision impairment, headache, gaze disturbances, headache, hypothalamic disturbances with one patient being severely marasmic baby. MRI was the standard investigation to plan treatment. Two patients in our series had a supraorbital craniotomy via eye brow incision while others underwent standard cranial craniotomies. Two patient s were kept under follow up. One patient was referred to radiation and medical oncology. One patient got gamma knife surgery. Rest underwent craniotomy and decompression. Histopathology was low grade glioma ( pilocytic astrocytoma )in most of cases one turned to be glioblastoma. Two of our patients postoperatively are still ventilator dependent in vegetative state being large hypothalamic chiasmal tumors

### 3. RESULTS

Our series of cases and treatment strategies adopted reveal clearly that optic tract gliomas can present as visual symptoms, local pressure effects as in orbit causing proptosis and can present as hypothalamic syndromes or as high intracranial pressure presentation. MRI remains standard gold standard to plan surgical treatment. Endocrinological workup and support of dedicated endocrinologist are key to good outcome. Treatment can vary from careful observation and follow up if vision intact to biopsy or decompression. Hypothalamic damage resulting in vegetative stage in postoperative period is well known.

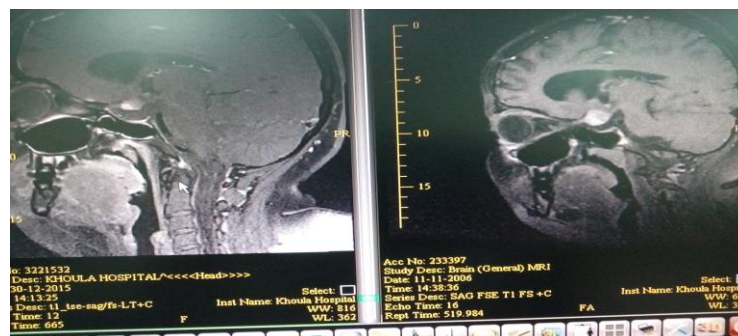


Fig 1 Pre and post op scan of patient no 9 with decompression and biopsy

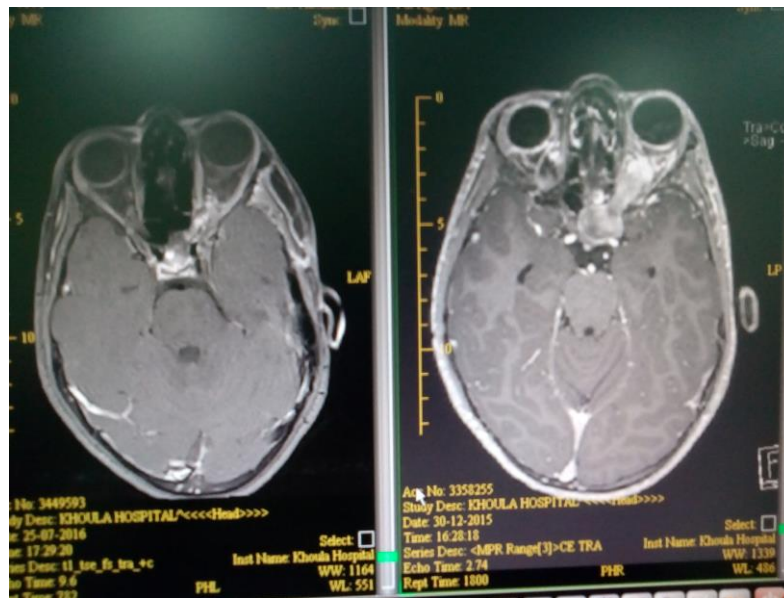


Fig 2 Patient no 4 with both Intera and extraorbital optic nerve involvement pre and post op scans

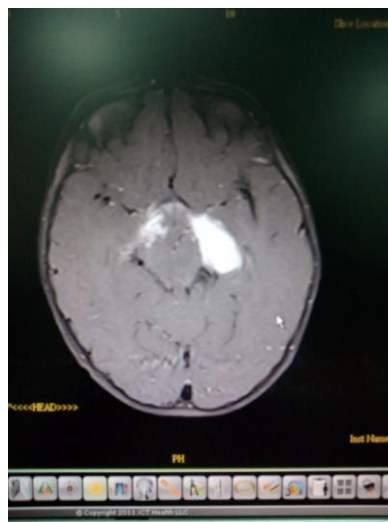


Fig 3 Patient no 3 bilateral optic radiation and chiasmal involvement

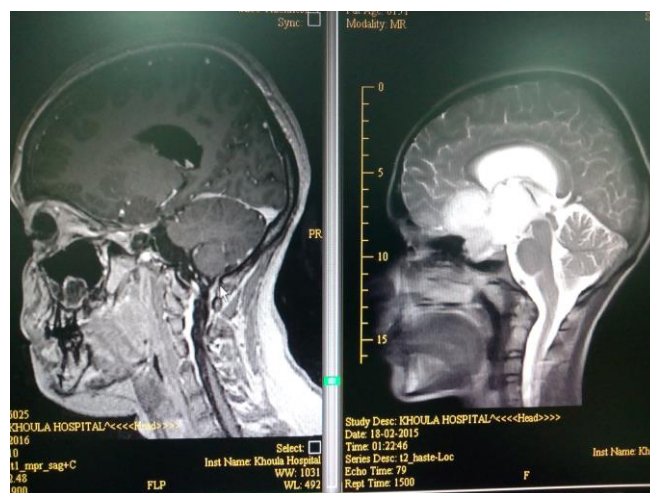
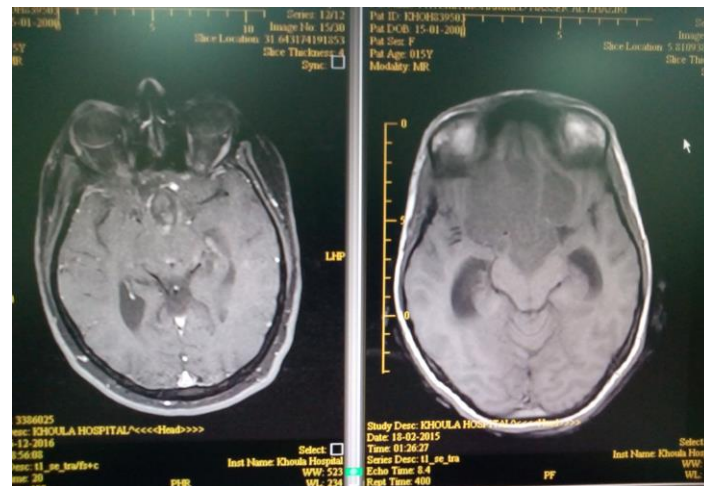


Fig 4 Pre and post op scans of patient no. 1



**Fig 5: Patient no 5 with large chiasmatic hypothalamic involvement presenting with marasmus pre and post op scans**

#### 4. DISCUSSION

Rasool N et al in 2017 stressed the need of individualization of all patients of optic pathways gliomas regarding treatment ranging from observation to biopsy to excision<sup>1</sup>. Mazerand E et al in 2017 described the use of intraoperative subcortical mapping of optic tracts in awake craniotomy using a virtual headset to safeguard optic tracts<sup>2</sup>. Kuenzle C et al in 1994 published their study of 21 patients of NF1 associated with optic tract glioma and described the various treatment strategies involved and tumour ranging from localized lesions to extensive causing brain stem infiltration causing mortality too<sup>3</sup>. Thiagalingam S et al in 2004 described their series of 54 patients of NF2 with optic tract gliomas. They found older children more frequently informed and stressed the need of regular ophthalmological assessment.<sup>4</sup> Kornreich L in 2001 studied patients of optic gliomas with and without neurofibromatosis and concluded that patients with NF have more of optic nerve involvement than of chiasma while this trend is reverse in patients without NF.<sup>5</sup> Shamji MF in 2007 studies the behavior of optic tract gliomas in different patient and concluded that differential genetic expression and histogenesis are responsible for different patient s presenting differently of optic tract gliomas and responding to treatment.<sup>6</sup>

#### 5. CONCLUSION

To conclude optic tract glioma is a slow growing tumour, which typically affects children and 30% have associated NF1. Malignant gliomas glioblastoma are seen in adults.

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