Conus Medullaris Metastatic Tumors-Report of Two Cases

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Introduction

The incidence of Intramedullary Conus Medullaris Tumours (IMSCM) in autopsied cancer patients ranges from 0.9% to 3.5%[1]. With improved survival incidence is increasing. It most commonly affects cervical segment followed by lumbar and thoracic segments. Metastasis to Conus medullaris (CM) is very rare with most common primary being lungs (40.74% %) followed by breast (33.33%)[2]. The CM metastatic can be often confused with other common conus lesions, especially in cases of unknown primary. Steroids and radiotherapy remains mainstay of treatment even after early detection of tumor via modern imaging techniques due to expected high risk/benefit ratio associated with surgery[3]. Tissue diagnosis, life expectancy, and neurological outcome mainly predominate surgical decision making. In view of short median survival and rarity of the disease, there is paucity of literature to prove whether surgery over conservative treatment improves the quality of life or survival. Here we report and discuss 02 cases of CM metastasis form lung carcinoma operated at our center.

CASE 1

A52-year-oldmale,aknowncaseofLungadenocarcinoma (Non Small cell type) with stable disease status following chemotherapy gave history of paresthesias involving both lower limbs with asymmetric paraparesis (Left > Right) from past 1 month. He presented to our hospital with urine retention for last 2 days. His Modified McCormick Score (MMCS) was Grade 4. His MRIDL Spine with contrast (Figure. 1) revealed an intramedullary space occupying lesion extending from D12-L1 with significant cord edema showing heterogeneous post contrast enhancement (measuring 38.3 mm craniocaudal, and 10.5 mm anteroposterior extent). He underwent Laminectomy D11 to LV1 with gross total excision of tumor. Tumor was bulging eccentrically from the surface and was moderately vascular. The histopathologic examination revealed a non small cell lung metastasis. Following surgery, his MMCS grade improved to 3 at 1 month which remained stable till his death 6 months later.

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CASE 2

A 65-year-old female, a known case of DM II with Hypertension gave history of low backache with radicular pain upto back of right leg from past 45 days. She later developed asymmetric paraparesis (Right > Left) from past 1 month, with urine retention at the time of admission. Neurological examination showed (MMCS) was Grade[4]. Her spinal MRI scan shows listhesis with pseudo disc bulge at L4-5 and a 23.7 × 9.4 mm mass lesion within the CM, with marked contrast enhancement and perilesional edema [Figure 2]. CT Thorax showed a mass that was 35 mm in diameter in posterobasal segment-right lower lobe of the lung. CT guided biopsy of Lung lesion revealed adenocarcinoma (Non Small cell type). Whole Body PET scan showed multiple Small brain metastases confirmed on CEMRI Brain, largest measuring 6mm. In view of rapidly progressing neurological deficit, she underwent D11-L1 laminectomy with gross total excision of tumor, histopathologic examination revealed a poorly differentiated carcinoma. Following surgery, the low backache and radicular pain were relieved and her MMCS grade improved to 3 at 1 month follow up. She was treated with radiation and chemotherapy. Her neurological grade remained stable till date but she continues to remain catheter dependant.

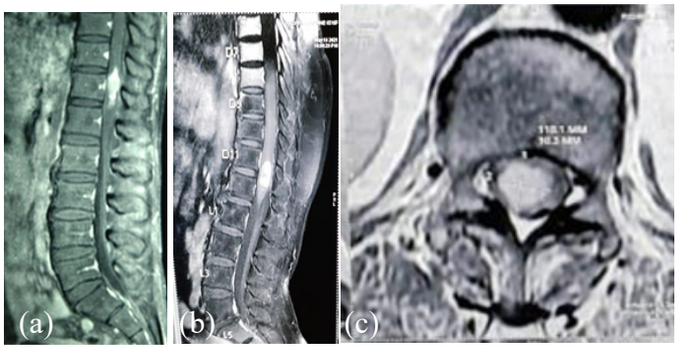

Figure 2. (a)T2W MRI view showing a mixed intensity lesion at conus with significant perilesional edema; Post-contrast sagittal (b) and axial (c) T1-weighted magnetic resonance (MR) images revealing an enhancing conuslesion, measuring 23.7 × 9.4 mm.

DISCUSSION

A Review of literature for the keywords "conus metastasis" yielded 15 cases [5-12] that had been surgically treated [Table 1]. Our two surgically treated patients are an addition to this number. Among CNS metastasis to brain is much more common than spinal cord, mainly due to higher brain perfusion (20%, cardiac output) over spinal cord (5%)[4]. Tumor spread occurs via : hematogenous seeding (most common) via arterial or Batson'svenous system; leptomeningeal invasion from embolic seeding via CSF; direct extension through Dura mater or nerve roots; or lymphatic spread from contiguous vertebral metastasis[1-9]. In our series, Mean age at presentation was 60 years, comparable to mean age (57.2 Yrs) in published literature (Table 1). Males outnumber females (Table 1, M: 70.6 % vs F: 29.4 %) in conus metastasis from lung carcinoma. This may be due to lung carcinoma being more prevalent in males. Myelopathy is the commonest presentation in most patients with intramedullary conus medullaris tumours; however, sphincter involvement is predominant factor in conus medullary metastasis[4]. 15% of unknown primary cases present as Conus metastasis as compared to 3% at other levels of spinal cord we report 50 % of the cases as also observed by Callovini et al[5]. The rapid progression of symptoms appears to be the most distinctive feature that helps to differentiate these metastatic lung lesions from primary intramedullary tumors [4,10,11]. The 4 most pertinent imaging features of ISCMs are 1) contrast enhancement, 2) spinal cord T2 hyperintensity out of proportion to lesion size; 3) hemorrhage and cystic/necrotic change are rare 4) association with synchronous CNS metastasis[3]. We didn't observe multiple intramedullary conus medullaris tumours in our patients. Synchronous brain metastasis and multiple ISCMs is a poor prognostic factor and relative contraindication to surgical intervention[12,13]. Microsurgical excision of the conus medullaris mass, not only provides tissue for histopathologic diagnosis, but also allows early recovery of neurological function. This could be attributed to resolution of the mass effect as well as edema causing tumor[5]. We performed Gross total resection (GTR) in both patients and noticed improved neurological outcome till last follow up, however we couldn't find any survival advantage (Table. 2). One of our patients died 6 months post surgery due to systemic manifestations of lung carcinoma and other patients is alive at 3 month follow up. Clinical outcome was reported in 14 cases (Table 1) out of which 78.5% of patients had some clinical improvement, whereas 21.4 % had no reported improvement. Mean survival was 7.4 months (with a range of 2 to 15 months). The decreased survival may be due to aggressive nature of the primary. Patients who underwent surgery plus radiotherapy and/or chemotherapy had a better survival as compared to only surgery/only radiotherapy and/or chemotherapy. Patients who received no treatment had a survival of 2 months only[2]. However, due to rarity of this disease and very few case reports available, it is difficult to compare conservative vs. surgical management. All published literature has shown that surgical intervention has improved neurological outcome but there is incoherence regarding extent of resection, with some series finding no correlation[12,13] and others promoting GTR. The extent of resection depends upon histology with poorly differentiated carcinomas could not be totally resected due to lack of a clear border between the tumor and the spinal cord[12]. The decision on whether or not to operate depends on the patient's performance status [12] .

Conclusion

The presence of intramedullary metastasis had a greater role on survival than systemic metastatic burden. Surgery may improve survival and neurological outcome in a selected group of patients with a solitary intramedullary lesion without any concurrent systemic or brain metastases In the future, a sophisticated treatment algorithm will be of great importance, as the incidence of intramedullary conus medullaris tumours will probably increase further. Larger, prospective studies are needed.

Table 1: Summary of the operated cases with conus medullaris lung metastasis

Author & yr	Age/ sex	Symptoms	Int from diag to CM met in months	Multiple ISCM lesions		Surg	Histo	RT/ Chemo	Outcome	Survival
Falliot et al, 2002	52/m	Rad, Ui	Unknowm primary	No	No	GTR	Poorly diff adeno ca	Yes	Improvement	9m
Nguyen et al, 2005	72/m	Asympto	18m	No	No	Biopsy	Non small cell ca	Yes	Improvement	9m
Guppy et al., 2006	54,M	Rad, Ui	Unkown Primary	No	No	Str	Poorly diff. adenoc	Yes	Improvement	2 M
Hieu et al., 2009	43, M 49, M 55, M 68, F 65, F	Rad Par Par, Ui Par, Ui Par	11 M 18 M 24 M 24 M 20 M	No No No No No	No Yes No No No	Gtr Gtr Gtr Gtr Str	Small cell carcinoma Na Epidermoid Small cell carcinoma Small cell carcinoma	Yes Yes Yes Yes Yes	Improvement Improvement Improvement Improvement Improvement	10 M 2 M 11 M 15 M (alive) 4M (alive)
Riviero, Boto, 2011	51, M	Par, Ui	3 M	No	No	Gtr	Squamous cell carcinoma	Yes	Improvement	Na
Mavani, 2013	46, F	Par, Ui	Unkown Primary	No	No	Gtr	Poorly diff. adenoc	Yes	Improvement	Na
Payer et al., 2015	77, M 59, M 54, M	Rad Par, Ui Rad	Unkown Primary Unkown Primary 46 M	No No No	No No Yes	Str Str Str	Non small cell carcinoma Squamous cell carcinoma Poorly diff. adenoc	No Na No	Unchanged Na Unchanged	3 M Na Na
Callovini et al., 2017	70, M 44, F	Par, Ui Rad, Ui	36 M Unkown Primary	No No	Yes No	Str Str	Small cell carcinoma Poorly diff. adenoc	Yes Yes	Improvement Improvement	10 M 11 M

Table 2: Our Cases

Author & yr	Age / sex	Symptoms	Int from diag to CM met in months	Multiple ISCM lesions		Surg	Histo	RT / Chemo	Survival
Case 1	52, M	Par, Ui	72 M	No	No	Gtr	Poorly diff. adenoc	Yes	6m
Case 2	68, F	Par, Ui	Unkown Primary	No	Yes	Gtr	Poorly diff. adenoc	Yes	3m (alive)

Rad= Radiculopathy, Ui= Urinary incontinence, Par= Paraparesis, Str= Subtotal resection, Gtr= Gross total resection, Na= Not available,RT= Radiotherapy, Ch= Chemiotheray, m= Months, carc = Carcinoma

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