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Cervical Intradural Extramedullary Melanocytoma , Associated with Nevus of Ito. Recurrence and Long-Term Outcome

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Abstract

Background: Melanocytoma is a rare pigmented central nervous tumor. In the spine, it may develop in meninges, extramedullary or intramedullary. It usually has good outcome after total excision.

Case report: A 40-year-old male patient was admitted to our hospital 12 years ago with a 3-month history of progressive neck pain and difficulty walking. On clinical examination, he showed upper dorsal bilateral gray blue hyperpigmentation, quadriparesis and bilateral hypoesthesia below C4. Cervical magnetic resonance imaging (MRI) T1-weighted images without contrast showed a C3-C4 intradural, extramedullary lesion. The patient underwent total microsurgical resection of the lesion. Histological and immunohistochemical analyses confirmed the diagnosis of melanocytoma. Another skin biopsy of the abnormal area showed histological findings of a blue skin nevus. Eight years after resection the patient presented with recurrent symptoms, which were similar to his initial presentation. Cervical MRI showed an intradural extramedullary tumor anterior to the spinal cord at the same C3-C4 level. The patient underwent a second complete tumor excision and melanocytoma was confirmed histologically. The patient significantly improved and remained well at last follow-up.

Conclusions: Intradural extra- or intramedullary melanocytoma is a rare benign tumor that frequently recurs but usually has good outcome following total excision.

Keywords: Spinal cord, Meningeal, Melanocytoma, Extramedullary, Skin Nevus of Ito, Outcome.

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Introduction:

Melanocytoma (MC) is a rare pigmented central nervous tumor described for the first time in 1972 by Limas and Tio [1]. MC is more common in females and usually has an intracranial localization. However, MC can also involve the spine, usually located intradurally, extra- or intramedullary [2, 3, 4,5]. Primary spinal MC usually originates from the melanocytes in leptomeninges [6]. Leptomeningeal tumors with melanin pigmentation are usually classified as meningeal MC, melanotic meningioma, melanotic schwannoma and melanoma [7]. MC is a usually benign tumor involving the posterior fossa or the spinal column. In the spine, it is usually benign but, occasionally may behave aggressively [8]. MC has been reported to metastasize, develop malignant transformation or local recurrence [9]. A systematic diagnostic strategy should, therefore be established for this tumor. Surgical resection and radiotherapy are used in its treatment [10].

We report here an uncommon case of intradural, extramedullary MC associated with skin nevus of Ito in the upper dorsal thoracic area with a local intradural and extramedullary recurrence 8 years after the initial surgical resection

Case Report:

A 40-year-old male patient was admitted to our hospital 12 years ago with a 3-month history of progressive neck pain and difficulty walking. On clinical examination, the patient showed an upper dorsal bilateral paramedial gray-blue hyperpigmentation (Fig.1a), quadriparesis, more on the left side and bilaterally hypoesthesia below C4. The patient also presented with a bilateral generalized hypertonia and hyperreflexia with bilateral clonus involving the patellar and ankle reflexes and spastic gait. Cervical magnetic resonance imaging (MRI) revealed a 2x2 cm intradural, extramedullary tumor located at the C3-C4 level. The tumor was hyperintense on the T1-weighted sagittal and axial imaging (Fig.2a) Sagittal T1 WI without contrast showing an intradural lesion opposite to C3/C4 level posteriorly with intrinsic T1 shortening. (b) Sagittal T1 WI and (c) axial T1 WI with contrast showing definite post contrast enhancement in the lesion along the adjacent dura suggestive of intradural extramedullary lesion. At corresponding level (Fig.2b), patient underwent total surgical resection under general anesthesia in a sitting position with bilateral cervical C3-C4 laminectomy and partial laminectomy of C2 and C5. The dura mater was exposed and showed a black aspect (Fig.1b). A longitudinal midline incision was performed and the pseudo-encapsulated black intradural extramedullary tumor was resected by microsurgical resection (Fig.1c). Histological Hematoxylin and Eosin staining of resected specimen showed Melanocytoma with a large number of melanin granules deposited in the tumor cells with consistent cell morphology and presence of small nucleoli (Fig 3 a,b). Immunohistochemical stains in meningeal melanocytoma showing positive expression of vimentin, S100, Melan-A, HMB-45 and negative expression of GFAP, EMA, and desmin. (Fig.4.a,b,c,d,e,f,g.h) . Hematoxylin and Eosin staining of resected specimen from the skin lesion showed Melanocytosis (nevus of Ito) (Fig.5 a,b) .

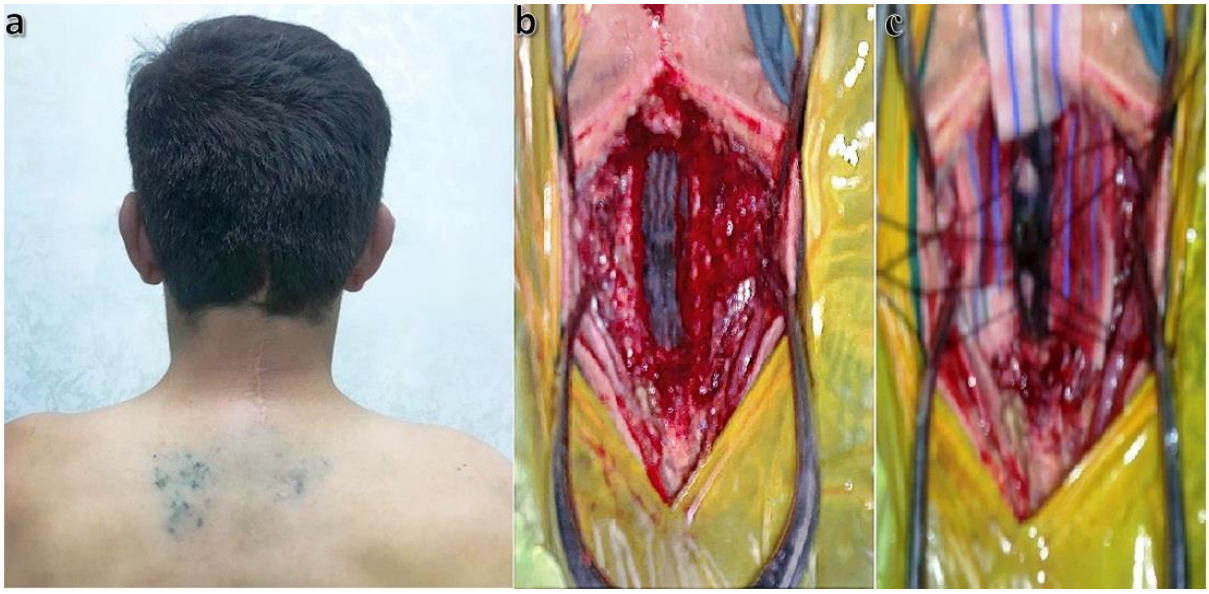

Fig1:
(a) Skin Gray blue hyerpigmentation in the upper thoracic paramedial region,
(b) intraoperative view after cervical C3-C4 laminectomy with black aspect of the dura,
(c) intraoperative view after opening the dura showing a black extramedullary mass.

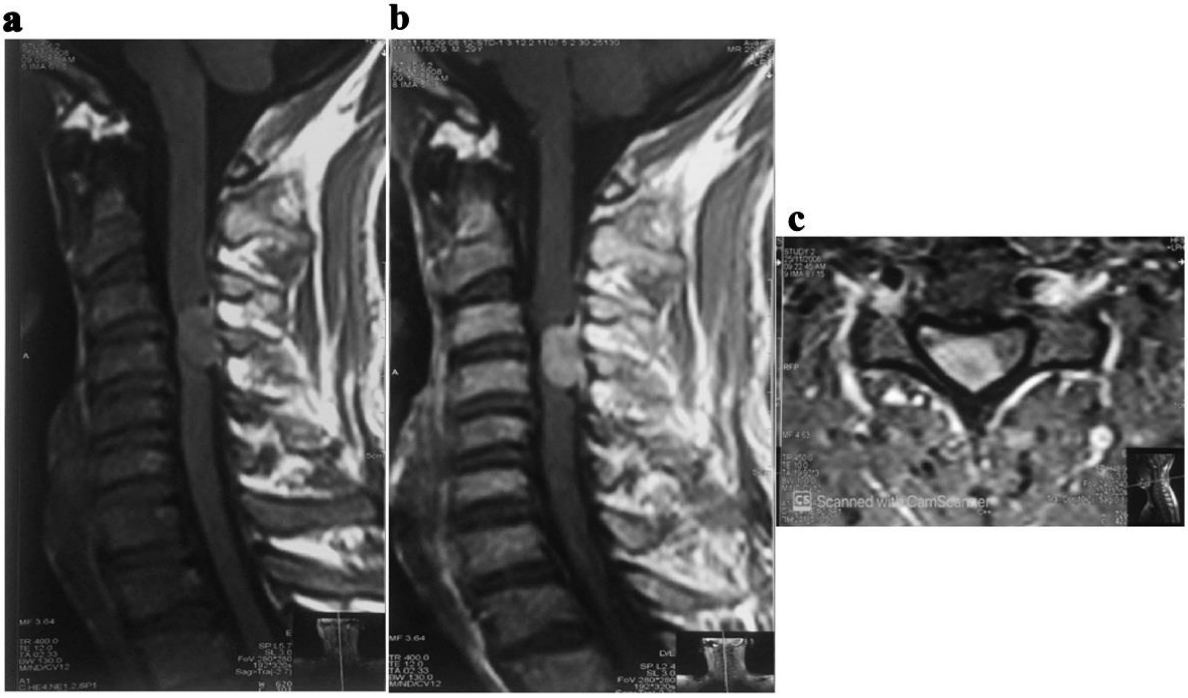

Fig.2:
(a) Sagittal T1 WI without contrast showing an intradural lesion opposite to C3/C4 level posteriorly with intrinsic T1 shortening.
(b) Sagittal T1 WI and (c) axial T1 WI with contrast showing definite post contrast enhancement in the lesion and adjacent dura.

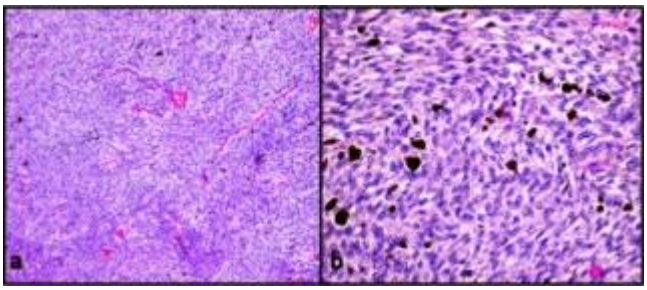

Fig.3:
(a) H&E X100: Meningeal melanocytoma showing, a proliferation of bland looking epithelioid to spindle cells arranged in short fascicles
(b)H&E 400X, showing oval to elongated nuclei with small eosinophilic nuclei and cytoplasmic melanin pigment

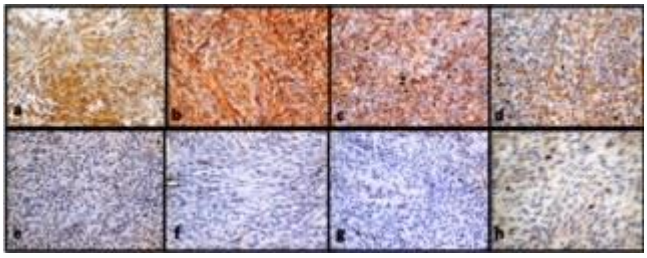

Fig4.: Immunohistochemical stains in meningeal melanocytoma showing positive expression of vimentin, S100, Melan-A, HMB-45 and negative expression of GFAP, EMA, and desmin.;
(a) Vimentin 400X, (b) S100 400X, (c) Melan-A 400X, (d) HMB45 400X, (e) GFAP 400X, (f) EMA 400X, (g) Desmin 400X. (h) Ki-67 proliferative index with an estimate of 2% (600X).

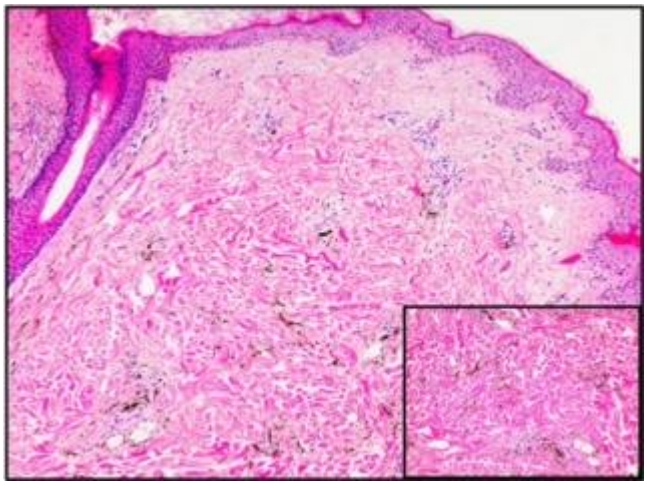

Fig.5: Melanocytosis (nevus of Ito) showing upper dermal proliferation of single dendritic melanocytes with cytoplasmic pigmentation. (H&E100 X, Inset, H&E, 400 X).

The patient had a satisfactory postoperative clinical course with progressive recovery of strength and sensation. He was discharged a few days following surgery without immediate complications returning back to his normal life. Eight years later, he experienced a progressive recurrence of his previous symptoms. Clinical examination revealed residual mild weakness in his right upper limb and mild spastic gait. He again developed generalized hyperreflexia and

bilateral patellar and ankle jerk reflexes. Cervical MRI T1-weighted images with contrast and fat suppression showed a 1.5 x.0.5 cm enhancing intradural extramedullary mass anterior to the cervical spinal cord with significant spinal cord compression at the same C3-C4 level (Fig.6 a, b).

Total microsurgical resection was again performed using the same previous surgical approach: the black-colored dura mater was exposed, a longitudinal incision liberated adhesions from the previous intervention and the left side of the cervical spinal cord was exposed followed by complete tumor resection. Histological and immunohistochemical analyses showed the same findings as those of the initially resected MC. Postoperative course was uneventful, with progressive recovery from the pain and the weakness of the left upper limb. Most recent follow-up cervical MRI, 4 years after the second surgical resection, showed no evidence of recurrence (Fig.6.c.d). Overall, the patient had a satisfactory clinical course with only sporadic neck pain, generalized hyperreflexia and a mild spastic gait.

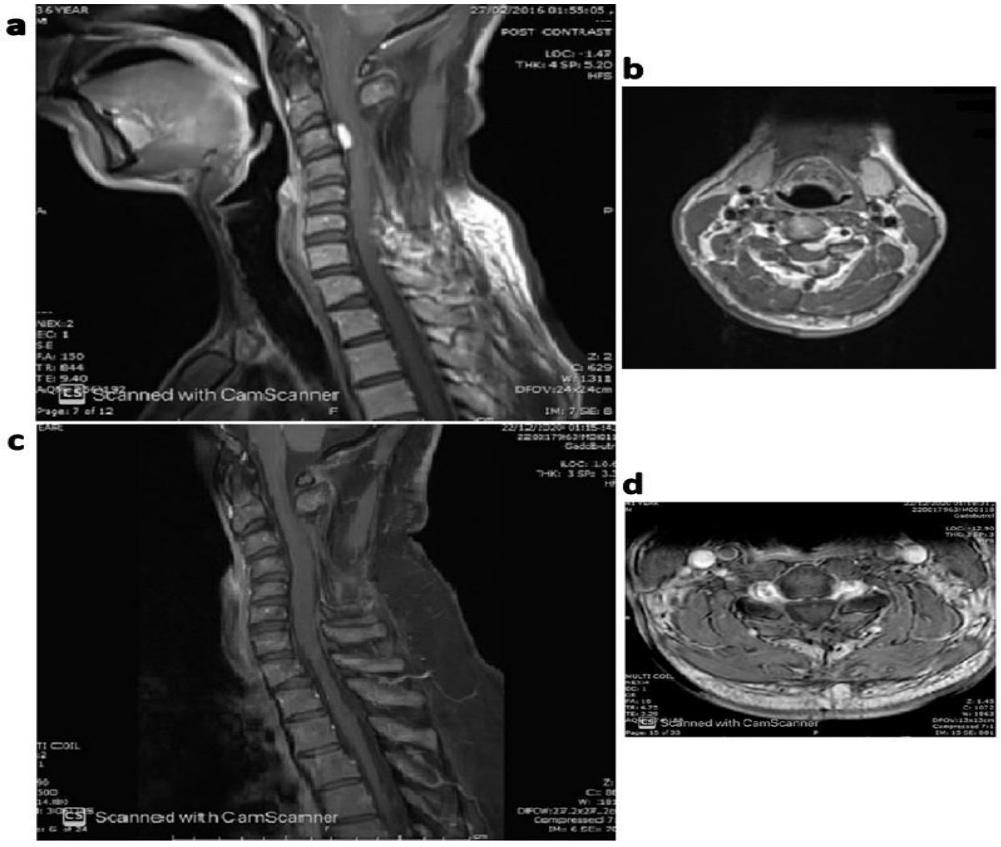

Fig.6

(a) follow up sagittal T1 WI with contrast and fat suppression
(b) axial T1 WI with contrast showing a recurrent enhancing intradural lesion opposite to C3 anteriorly
(c) post operative sagittal and axial
(d) T1 WI with contrast and fat suppression showing complete resection of the recurrent lesion

Discussion

The World Health Organization (WHO) classification of brain tumors in 2016 classified the primary MC as meningeal melanocytoma, meningeal Melanocytosis, meningeal melanoma and meningeal melanomatosis, [11].

MC is generally a benign lesion with a low incidence rate while melanoma is a malignant lesion [12]. Occasionally MC metastasizes, develops malignant transformation or recurs locally [8, 9]. In our case, the patient experienced tumor recurrence 8 years after the initial resection.

However, no histological change was observed.

The pathogenesis of CNS primary melanocytoma remains unknown[6]. MC presents with a peak incidence in the 5th decade [13]; in our case it was diagnosed at the age of 29 years. MC has a slight female predilection (1.5:1) [2,14,15]. It usually occurs in the thoracic followed by the cervical spine as in our case; it is less common in the lumbar spine [2,16]. Skin lesions in MC have been reported especially in association with intracranial MC occasionally presenting a nevus of Ota.[17]. Less commonly skin nevus are associated with spinal MC [18], Our case is associated with nevus of Ito. Association with intracranial superficial siderosis has been also reported [19,20].

The most common symptoms of spinal MC are motor and sensory deficits, followed by neck pain [13]. Our patient presented with quadriparesis and bilateral hypoesthesia below the level of lesion.

Radiologically the extramedullary location has similar and well -circumscribed appearance as meningioma [15]. However, the MRI pattern of hyperintensity on T1-weighted images and hypointensity on T2-weighted images caused by melanin can differentiate MC from meningioma [15], as shown in our case.

Intraoperative pigmented structures and encapsulated tumor are usually observed depending on the amount of the melanin [16]. In our patient, there was evident melanin pigmentation involving the dura and intradural mass.

Histologically, MC consists of tight spindle differentiated melanocytes and prominent nuclei [16]. Immunohistochemically, MC is positive for HMB-45, S-100 protein and vimentin antibody [15]. In our case, tight spindle cells with prominent nuclei and pleomorphism were detected and immunohistochemistry was positive for HMB-45, and Melano-A.

MC recurrence is uncommon and correlates with surgical treatment not with gender, age or tumor location [14,21]. In our case, recurrence developed after 8 years of initial tumor excision. The 12-year clinical follow-up after initial diagnosis showed the patient to be in good clinical condition confirming the good outcome of spinal MC. Interestingly, in our patient, MC recurred anterior to the spinal cord while at first presentation it was located posterior to the spinal cord. This new location could be related the diffusely affected meninges [8], or by spreading of MC cell from the original tumor site, as previously reported [9,22]

An aggressive approach is recommended for treatment of MC, including total tumor excision. In addition, radiotherapy is recommended for lesions that were incompletely resected [23]. Some authors even recommend high local doses of radiotherapy after complete surgical resection [24]. Reports of long-term follow-up of MC are limited. In our case, the patient had 12 years follow-up period which is one of the longest in the literature surpassed only by only one case, who had a 15 years of follow-up [2].

Conclusions: Intradural extra- or intramedullary melanocytoma is a rare benign tumor that frequently recurs but usually has good outcome following total excision without radiotherapy. A close clinical follow-up is recommended for early detection of potential recurrence

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ورم الخلايا الصباغية خارج النخاع الشوكي وداخل الغشاء الدماغي العنقي ، المصطحب بصبغة في الجلد و التكرار والنتائج على المدى الطويل

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الملخص

الخلفية: الورم الصباغي هو ورم عصبي مركزي مصطحب بصبغ جلدي نادر. و متواجد في العمود الفقري ، و قد يتطور في السحايا أو خارج النخاع أو داخل النخاع.وعادة ما يكون لها نتائج جيدة بعدألأستئصال الجراحي الكلي

تقرير حالة: تم إدخال مريض يبلغ من العمر 40 عاما إلى المستشفى قبل 12 عاما حيث كان يعاني من الم في العنق و صعوبه في المشي متزايد منذ 3 أشهر قبل حضورة للمستشفى . في الفحص السريري ، أظهر وصبغ جلدي أزرق رمادي في منطقة اعلى الظهر، و ضعف رباعي في الأطراف ونقص في ألأحساس تحت مستوى الجذر العصبي العنقي الرابع في الجانبين. صوره الرنين المغناطيسي للعنق T1 بدون ملون اظهرت وجود آفة C3-C4 داخل الغشاء الشوكي وخارج النخاع الشوككي. خضع المريض لاستئصال مجهري كامل للآفة. أكدت التحليلات النسيجية والكيميائية المناعية تشخيص الورم الميلانوسي. أظهرت خزعة جلدية أخرى للمنطقة غير الطبيعية نتائج نسيجية لحمة الجلد الزرقاء.

بعد ثماني سنوات من الاستئصال ، قدم المريض أعراضًا متكررة ، كانت مشابهة ل ألأعراض السريرية ألأولي. و أظهر التصوير بالرنين المغناطيسي العنقي ورم داخل الغشاء الشوكي و خارج النخاع الشوكي و أمام الحبل الشوكي على نفس المستوى السابق

خضع المريض لاستئصال الورم الكامل الثاني وتم تأكيد الورم الميلانوسي من الناحية النسيجية. تحسن المريض بشكل ملحوظ وبقي في وضع صحي جيدًا و مستقر في المتابعة في العيادات الخارجية

الاستنتاجات: الورم الميلانوسي داخل الغشاء الدماغي داخل النخاع هو ورم حميد نادر يتكرر في كثير من الأحيان ولكن عادة ما يكون له نتائج جيدة بعد الاستئصال الكلي

الكلمات الدالة: الحبل الشوكي، الغشاء الدماغي. الورم الميلانوسي ، خارج النخاع ، جلد نيفوس من Ito ، النتيجة.