CASE REPORT

Isolated third nerve palsy: a rare neurological presentation of Burkitt's lymphoma

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Accepted 13 May 2017

SUMMARY

Lymphoma patient presenting with isolated third nerve palsy is relatively rare, and diagnosis of underlying disease may be challenging. Until this date, less than 20 cases have been described in the literature. This is the case of a 3-year-old boy who presented to neurologist with ptosis of left eye for 8 days. On examination, abdominal mass was detected, and the child was referred to paediatric surgery department. Laparotomy and excision of the mass was done. Histopathology and immunohistochemistry of the mass confirmed it to be a case of Burkitt's lymphoma. At this point, the patient was referred to haematology department. Contrast-enhanced CT brain showed infiltration around left cavernous sinus. Patient was treated with two cycles of R-CODOX-M/R-IVAC. Ptosis improved completely within few days of starting chemotherapy. Follow-up positron emission tomography CT scan done after the second cycle of chemotherapy revealed no metabolically active disease.

BACKGROUND

Lymphoma as cause of isolated third nerve palsy has rarely been described. To the best of our knowledge, only one case of Burkitt's lymphoma with isolated third nerve palsy has been reported as of date. Cavernous sinus infiltration is also rare manifestation of Burkitt's lymphoma. There are less than 20 case reports describing isolated third nerve palsy secondary to lymphoma. With this case we review the published cases with isolated third nerve palsy.

CASE PRESENTATION

A 3-year-old boy was referred by family physician to neurologist for evaluation of ptosis of left eye for 8 days. Associated with this, the child had complaints of pain abdomen, vomiting and constipation of same duration. On examination, neurologist noted large abdominal mass and referred this child to paediatric surgery department. The child developed intestinal obstruction. Laparotomy with excision of mass and resection anastomosis of involved segment was done (on laparotomy, mass infiltrating gut loops in right iliac fossa was observed). Histopathological examination (HPE) and immunohistochemistry (IHC) of mass confirmed it to be Burkitt's lymphoma. At this stage, the child was referred to haematology department.

When the child was received at our institute he appeared sick, had tachycardia (pulse 140/min),

blood pressure of 90/60 mm Hg, large intra-abdominal mass was palpable. Neurological examination was normal except third nerve palsy. There was ptosis, exotropia and hypotropia of left eye. Also, there was paralysis of adduction and elevation. The pupil was spared and so there was depression movement of the eyeball. Final diagnosis of patient was Stage 4 Burkitt's lymphoma (central nervous system (CNS) involvement—documented on contrast-enhanced (CE) CT brain).

INVESTIGATIONS

Complete haemogram

Haemoglobin: 9.8 g/dL, total leucocyte count: $13.7 \times 10^9/L$ normal differential, platelets: 360 000/ mm^3 .

Tumour lysis parameters

Urea/creatinine: 12/0.36 mg/dL.

Uric acid: 1.6 mg/dL.

Na/K: 137/3.2 meq/L.

Lactate dehydrogenase: 1020 IU/L.

Calcium/phosphate: 8.8 mg/dL and phosphate: 2.4 mg/dL.

Hepatitis B surface antigen, IgM anti-hepatitis B core antibody, anti-hepatitis C virus, anti-HIV I and II

Non-reactive.

CECT abdomen (done by department of paediatric surgery)

Multiple mesenteric lymph nodes in right lumbar region and upper right iliac fossa with thickening of overlying parietal tissue, retroperitoneal lymphadenopathy was also noted. Mass was found to be infiltrating small intestinal loops in right iliac fossa. Multiple soft tissue density in both the kidneys. Mild ascites, mild hepatosplenomegaly (figure 1).

HPE of excised intestinal mass

Sheets of medium sized lymphoid cells having vesicular nuclei with multiple nucleoli. Brisk mitotic activity was seen. Starry sky appearance was noted (figure 2).

Immunohistochemistry

Neoplastic cells were found to be positive for PAX5, CD20, CD10, C-MYC. Ki67 labelling index of 100%.

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To cite: Kalantri SA, Nayak A, Datta S, et al. *BMJ Case Rep* Published Online First: [please include Day Month Year]. doi:10.1136/bcr-2017-219670

Figure 1 Contrast-enhanced CT abdomen with large intra-abdominal mass (72×63 mm in size) in right iliac fossa.

Bone marrow aspiration and biopsy

No involvement by Burkitt's syndrome.

CECT brain

Extra-axial leptomeningeal nodular enhancement along the pituitary fossa and the left cavernous sinus? Leptomeningeal deposit (figure 3).

Cerebrospinal fluid analysis

Normal.

DIFFERENTIAL DIAGNOSIS

For third nerve palsy:

1. Leptomeningeal involvement

Figure 2 Histopathological examination of excised intestinal mass showing sheets of medium-sized lymphoid cells having vesicular nuclei with multiple nucleoli. Brisk mitotic activity was seen. Starry sky appearance noted (H&E 40×).

Figure 3 Coronal section of contrast-enhanced CT brain showing extra-axial leptomeningeal nodular enhancement along the pituitary fossa and the left cavernous sinus? Leptomeningeal deposit.

2. Direct infiltration of nerve
3. Paraneoplastic manifestation

TREATMENT

As the child was very sick, decision to start chemotherapy immediately was taken and positron emission technology (PET)-CT scan was avoided. Tumour lysis prophylaxis was started and the child was treated with two cycles of R-CODOX-M/R-IVAC. By day 5 of chemotherapy, third nerve palsy resolved completely. He had febrile episodes of neutropaenia during each cycle and was treated as per standard IDSA protocol. PET-CT after completion of chemotherapy showed no fludeoxyglucose avid lesion.

OUTCOME AND FOLLOW-UP

1. Disappearance of third nerve palsy by day 5
2. Follow-up PET-CT done after completion of chemotherapy: no metabolically active disease. Patient was in complete remission

DISCUSSION

Incidence of Burkitt's lymphoma is approximately three cases per million persons per year.¹ CNS involvement in Burkitt's lymphoma is seen in around 15% of cases at presentation.² Multiple cranial nerve palsies have been described in Burkitt's lymphoma, but isolated oculomotor nerve palsy is described rarely. Lymphoma as cause of isolated third nerve palsy is described in less than 20 case reports and to best of our knowledge, Burkitt's lymphoma as cause of isolated third nerve palsy has been described in only one case report previously.³

In a review of 19 detailed case reports of lymphoma with isolated oculomotor nerve, most common reason for isolated third nerve palsy was found to be invasion of the cavernous sinus and the surrounding leptomeninges with or without oculomotor nerve infiltration. Most common lymphoma associated with isolated oculomotor nerve palsy was large B cell lymphoma (8/19 cases).⁴⁻⁹ Cavernous sinus involvement is rarely described with Burkitt's lymphoma. There are less than 15 previously described case reports of this lymphoma infiltrating cavernous

sinus.^{10–22} There was bilateral involvement of cavernous sinus in four cases.^{11 17 18 21} Paraneoplastic manifestation as a cause of isolated third nerve palsy has been proposed in one case report.⁷

Though combination of cerebrospinal fluid (CSF) analysis and MRI brain are diagnostic in majority of cases, it is important to note that in 4/10 cases described in earlier review had negative results.⁸ It is important to note that single CSF analysis yield positive results only in 60% of cases and second lumbar puncture yield positive results in additional 33% of cases.²³ Initial MRI brain can be normal and follow-up MRI may be necessary.

CNS involvement is associated with poor 5-year survival in Burkitt's lymphoma. This child had a PET negative complete remission after completion of chemotherapy and the child is in remission 9 months after.

Learning points

- ▶ Rare Burkitt's lymphoma may be the cause of isolated third nerve palsy.
- ▶ Neuroimaging should be carefully screened for cavernous sinus infiltrate.
- ▶ With prompt initiation of therapy, there may be complete recovery of nerve palsy.

Contributors SAK, AK, SD managed the case. SAK wrote the report. MB guided the patient management and edited the report.

Competing interests None declared.

Patient consent Obtained from guardian.

Provenance and peer review Not commissioned; externally peer reviewed.

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