CASE REPORT

Renal malakoplakia followed by chronic myelogenous leukaemia: treatment challenges case report and literature review

Jameela Mohammed Al Salman, Aysha Husain

Department of Internal Medicine, Salmaniya Medical Complex, Manama, Bahrain

Correspondence to

Dr Jameela Mohammed Al Salman, jalsalman@hotmail.com

SUMMARY

Malakoplakia is a rare granulomatous disorder of unknown aetiology and usually affects patients with underlying immunosuppression. This disorder usually involves the genitourinary tract but has been reported in a wide array of anatomical sites. We are presenting, what is to our knowledge, the first case in the literature in which a patient was diagnosed with malakoplakia and after his successful management; he was diagnosed with chronic myelomonocytic leukaemia. All cases of malakoplakia reported in the literature were either preceded or accompanied by an immunosuppressive state.

BACKGROUND

Malakoplakia is a chronic inflammatory disease seen mostly in immunocompromised patients. In our case, the patient had malakoplakia and received appropriate antibiotics therapy.¹ Later on, he developed chronic myelogenous leukaemia, which imposed further treatment challenges as the disease, and its treatment might reactivate his malakoplakia disease.

CASE PRESENTATION

An adult Bahraini healthy man, with no prior medical illnesses, presented with a history of right-sided abdominal pain and swelling for about 4 months on April 2007.

He gave a history of recurrent urinary tract infection, for which he received multiple courses of oral antibiotics without further investigation.

CT scan of abdomen and pelvis was done and it showed right iliac fossa mass of undetermined aetiology.

Unfortunately, the patient was lost to follow-up and presented 6 months after (October 2007) to the accident and emergency department with right-sided flank pain, fever and vomiting. He gave a history of urinary symptoms in the form of dysuria and hesitancy.

He underwent surgical resection of his abdominal mass in an overseas centre 6 months before (April 2007) with a histopathology report showing a diagnosis of malakoplakia. Details of the surgical procedure were not available. The patient felt better after his surgery and was kept on no medication.

On examination he had a low-grade fever with a temperature of 37.5 (C, slight tachycardia, his heart

rate was 105 beats /Mmin and blood pressure 105/58 mm Hg.

Abdominal examination showed well-healed mid-line scar of the lapotomy procedure, mild tenderness in right iliac fossa with 15×15 cm firm mass that was fixed to underlying tissues. The right kidney was palpable.

INVESTIGATIONS

Urinalysis results showed red blood cells of 8–10 per high power field and white blood cells of more than 50 per high power field.

White blood cell count was $21.8 \times 10^9/l$ with 72% neutrophils. Haemoglobin level was 7.5 g/dl with low mean corpuscular volume (67 fl) and platelet count was $194 \times 10^9/l$.

Ultrasound scan of the abdomen showed right-sided hydronephrosis with soft tissue hypoechoic mass in the right iliac fossa region measuring 9×6 cm (figure 1).

TREATMENT

He underwent emergent nephrostomy procedure, and the drain was mainly pus-containing fluid. CT scan of abdomen and pelvis was requested on the following day, which showed same mass in the right side (figure 2). The histopathology slides were reviewed from the resected mass and it showed the pathognomonic lesion of Michaelis-Gutmann bodies (figure 3). Accordingly patient was started on following medications septrin 1 tablet double strength twice a day, ciprofloxacin 750 mg twice a day, erythromycin 500 mg Q6 h and vitamin C 1 tablet once a day. Retrograde DJ stent was inserted under fluoroscopy guidance. The patient was followed up in the clinic for almost 1 year and was kept on prophylactic antibiotics through out (septrin once a day). Repeated CT scan showed a regression of the mass.

OUTCOME AND FOLLOW-UP

In October 2008, the patient complained of generalised fatigability, left-sided abdominal pain and fever. He was compliant with his treatment throughout the follow-up period but these symptoms were new to him. Abdominal examination was significant for hepatosplenomegaly. His complete blood count on October 2008 showed unusual rise in his white cell count to 91.1×10^9 with band cells of 15% and metamyelocyte of 13%. His haemoglobin remained low with the level reaching 6.7 mg/dl and his platelet was around 246×10^9 . The patient underwent

To cite: Al Salman JM, Husain A. *BMJ Case Reports* Published online: [please include Day Month Year] doi:10.1136/bcr-2012-006345

Figure 1 Ultrasound image of the right kidney showed a dilated urinary pelvis measuring 2.3 cm.

bone marrow aspiration, which showed a picture of chronic myelomonocytic leukaemia. The patient underwent hydroxyurea therapy and was scheduled to undergo bone marrow transplantation as definitive therapy for his leukaemia. However, there were questions regarding the possible reactivation of his malakoplakia. Unfortunately, the patient was admitted again months after (November 2008) with acute transformation of his leukaemia and his condition deteriorated so rapidly. He expired 5 days after admission.

DISCUSSION

Malakoplakia was first described by Michaelis and Gutmann in 1902. The term malakoplakia is derived from the Greek words 'malakos' (soft) and 'plakos' (plaque).^{2,3} It is a chronic inflammatory reaction that can affect any body organ; urinary bladder is the most frequently affected one.⁴ There are fewer than 500 cases reported in the USA with age at presentation ranging from 6 months to 85 years.³ Most patients have genitourinary tract disease. The international frequency of malakoplakia occurrence is the same as in the USA.⁵ Female predominance was observed in genitourinary cases with a ratio of 4–1.³ Malakoplakia most often occurs in immunocompromised patients and mortality is attributed mostly to the underlying disease, while the morbidity

Figure 2 CT scan showing the mass on the right side.

Figure 3 Michaelis-Gutmann bodies.

relates to the chronicity of the infection which can resist the local and systemic therapy.⁵

The vast majority of patients diagnosed with malakoplakia have a history of recurrent urinary tract infection, with *Escherichia coli* being the most common cause; however, other organisms, such as *Staphylococcus aureus*, bacteria belonging to the genus *Proteus*, *Klebsiella*, *Pasteurella* or *Rhodococcus*, mycobacteria and fungi can also rarely cause the condition.⁶

The patient also gave a history of recurrent urinary tract infections and all the cultures were positive for *E coli* but his treatment was limited for short courses of oral antibiotics extending to 1 week maximum without further investigation.

This disease is commonly associated with immunosuppression, although this was not the case in our patient at the time of his diagnosis. Malakoplakia was reported in patients with AIDS, leukaemia and organ transplantation.³

The pathogenesis is not entirely understood, and it is linked to defective phagocytotic mechanism. The defect stems from a decreased intracellular level of cyclic guanosine monophosphate (cGMP), which prevents macrophages from performing their normal microtubular function and lysosomal activity. Such impaired function results in incomplete bacterial elimination, with bacterial degradation products accumulating within the lysosomes of macrophages and monocytes causing the formation of Michaelis-Gutmann bodies. The composition of Michaelis-Gutmann bodies has been shown to be 94.6% organic and 5.4% inorganic components like calcium, phosphorus and iron.^{3,5,6}

The pathogenesis was linked to immunosuppression in the form of therapy with corticosteroids and immunosuppressants such as azathioprine. A study report of four cases on which therapy with malakoplakia showed a reversal of the disease and normalisation of white cell function after discontinuation of the immunosuppressant therapy.⁷

Clinically, malakoplakia is difficult to diagnose because the clinical appearance varies from silent nodules to other manifestations according to the organ involved. In the respiratory system, it can mimic bronchogenic carcinoma or tuberculosis. Malakoplakia of the female genital tract usually presents with vaginal bleeding. There are few reported cases of malakoplakia in the central nervous system. Most of these cases are in infants in a clinical setting of herpes viral infection. In adults three cases were reported in patients with cerebral infarction.³

The gastrointestinal tract is the second most common site of involvement by malakoplakia. The descending colon, sigmoid colon and the rectum are the most common sites of involvement. Presentation varies from diarrhoea, abdominal pain, haemorrhage or obstructions. The association between malakoplakia and colon cancer is well documented in the literature. An

early report found an association between the two conditions in more than 30% of cases,⁸ while recent findings suggest that malakoplakia occurs as an incidental finding confined to the area adjacent to the carcinoma.⁹

Diagnosis depends on histopathology with demonstration of Michaelis-Gutmann bodies. Gram stain may show Gram-negative bacteria.¹⁰

Immunohistochemical studies showed positive results for CD68 antibodies, lysosomes and α -chemotrypsin in macrophages.¹⁰

The treatment of malakoplakia depends on medical therapy in the form of multiple antibiotics that are concentrated in macrophages (eg, quinolone and trimethoprim-sulfamethoxazole).

Antibiotics against *E coli* seem to be associated with high cure rate.⁵

Treatment with bethanechol chloride has been used with antibiotic therapy and it showed improvement in cGMP level that is responsible for macrophages killing the ability against bacteria.¹¹

Ascorbic acid has been used to increase the cGMP and cyclic AMP (cAMP) levels in monocytes, which may represent an effective strategy for therapy. An insufficient number of patients have been treated with ascorbic acid to determine its overall effect.⁵

Discontinuation of immunosuppressive therapy is advisable as part of the treatment plan, but in our case, patient developed leukaemia after his diagnosis of malakoplakia leaving him at risk for reactivation because of the disease and its treatment. There are no data to suggest the value of this therapy during bone marrow transplantation. In our patient we will have continue his antibiotic therapy along with vitamin C during the period of transplantation to protect him from such risk.

Most of the cases reported in the literature followed an immunocompromised state, but rarely in immunocompetent people and never reported that the immunocompromised state developed after the diagnosis of malakoplakia.

We aimed through this case presentation to highlight the importance of diagnosing malakoplakia disease in immunocompetent patients. In addition, to emphasise the need for more investigations and studies in relation to malakoplakia in order to help us understand the aetiology, the pathophysiology and the natural history of this rare entity. This will enable the medical community in early diagnosis, adequate management and follow-up of these cases.

Learning points

- Malakoplakia is a rare medical entity and a high index of suspicion is needed in both immunocompetent and immunocompromised hosts in order to diagnose.
- Most common cases reported in the literature were in the genitourinary tract.
- Early diagnosis and treatment appear beneficial.
- Patients who had malakoplakia should be followed up closely for evaluating the possibility of developing immunodeficiency such as other malignancies.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

- 1 El Jamal SM, Malak SF, Cox RM, *et al.* Extragenitourinary malakoplakia in a patient with myeloma clinically mimicking extramedullary myelomatous disease. *Hum Pathol* 2011;42:602–4.
- 2 Shane K, Kohl MD, Christine P, *et al.* Cutaneous malakoplakia. *Arch Pathol Lab Med* 2008;132:113–7.
- 3 George M, Yousef MD, Naghibi B. Malakoplakia outside the urinary tract. *Arch Pathol Lab Med* 2007;131:297–300.
- 4 Hong JJ, Liao PL, Lin JL, *et al.* Bilateral renal parenchymal malakoplakia presenting as hemolytic—uremic syndrome. *Nephrol Dial Transplant* 1999;14:2206–9.
- 5 Kiel RJ. Malakoplakia author. e-medicine Updated: Oct 21, 2008
- 6 Sanchez LM, Sanchez SI, Bailey JL. Malakoplakia presenting with obstructive nephropathy with bilateral ureter involvement. *Nat Rev Nephrol* 2009;5:418–22.
- 7 Biggar WD, Crawford L, Cardella C, *et al.* Malakoplakia and immunosuppressive therapy. Reversal of clinical and leukocyte abnormalities after withdrawal of prednisone and azathioprine. *Am J Pathol* 1985;119:5–11.
- 8 McClure J. Malakoplakia of the gastrointestinal tract. *Postgrad Med J* 1981;57:95–103.
- 9 Bates AW, Dev S, Baithun SI. Malakoplakia and colorectal adenocarcinoma. *Postgrad Med J* 1997;73:171–3.
- 10 Patnayak R, Reddy MK, Subramanian S, *et al.* An unusual case of bilateral hydronephrosis caused by uretero-vesico malakoplakia in a young male: a case report and review of the literature. *Cases J* 2009;2:7527.
- 11 Abdou NI, NaPombejara C, Sagawa A, *et al.* Malakoplakia: evidence for monocyte lysosomal abnormality correctable by cholinergic agonist in vitro and in vivo. *NEJM* 1977;297:1413–19.

Copyright 2013 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- Submit as many cases as you like
- Enjoy fast sympathetic peer review and rapid publication of accepted articles
- Access all the published articles
- Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow