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Russell body cervicitis: A case report and literature review highlighting diagnostic pitfalls

Lalani De Silva [a,*], Kaumadi Udeshika [a], Sinha De Silva [b], Priyani Amarathunga [a]

[a] Faculty of Medicine, University of Colombo, Colombo, Sri Lanka
[b] Ministry of Health, Sri Lanka

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ABSTRACT

Russell bodies have been observed in various inflammatory and neoplastic conditions, although their presence in the female genital tract is rare, with fewer than ten documented cases of Russell body cervicitis. This case report appears to be the first of Russell body cervicitis identified during pregnancy. A 28-year-old woman, at 20 weeks of gestation, underwent a cervical polypectomy after a polyp was detected incidentally during a cervical cerclage procedure. Pathological examination revealed an inflamed endocervical polyp with predominant plasma cell infiltrate. Most of the plasma cells contained intracytoplasmic Russell bodies and there were some Mott cells. Immunohistochemical stains confirmed the polyclonal nature of the plasma cell infiltrate.

This report highlights the diagnostic challenges associated with Russell body cervicitis, given its rarity and histological resemblance to other inflammatory and neoplastic conditions. A review of the literature reveals that the few reported cases presented as a non-neoplastic process during reproductive age, with an uneventful follow-up. This report contributes to the limited knowledge of Russell body cervicitis, particularly in the context of pregnancy.

1. Introduction

Russell bodies are large, intracytoplasmic eosinophilic inclusions found in plasma cells. They are formed due to the accumulation of excess or abnormally folded immunoglobulins within the endoplasmic reticulum [1,2]. A single plasma cell with multiple Russell bodies within it is referred to as a 'Mott cell', named after the British neurologist Frederick Walker Mott, who first described these cells in the brain tissue of monkeys infected with trypanosomiasis [3].

Russell bodies have been described in association with both inflammatory and neoplastic conditions, including autoimmune diseases, syphilis, HIV, and plasma cell dyscrasias [4,5]. Inflammation associated with Russell bodies has been reported in various regions of the body, particularly the gastrointestinal tract in association with *H. pylori* [6–8]. However, involvement in female genital structures is extremely rare. An extensive literature search reveals fewer than ten documented cases of Russell body cervicitis.

Due to its rarity, the evidence on the pathology and outcome of this condition is limited. Here, the literature is summarised and seemingly the first reported case of Russell body cervicitis during pregnancy is presented. The diagnostic challenges in routine practice are discussed.

A comprehensive literature search was conducted in PubMed and Google Scholar in October 2024 to identify studies on Russell body cervicitis. In PubMed, the search terms "Russell body cervicitis," "Russell bodies AND cervicitis," "Russell bodies AND cervix inflammation," and "Plasma cells AND cervicitis," yielded a total of 3191 articles. In Google Scholar, the search terms included "Russell body cervicitis," "(Russell bodies AND cervicitis)," "(Russell bodies AND cervix inflammation)," and "(Russell bodies OR Mott cells AND cervicitis)." All searches were screened manually by reviewing titles and abstracts to ensure they discussed Russell bodies in cervicitis. Case reports, review articles, and histopathological studies were included. Only five articles were finally selected for analysis.

2. Case Presentation

A 28-year-old woman presented routinely to the antenatal clinic at 20 weeks of gestation in her first pregnancy. The pregnancy had been uncomplicated, except for a detection of a short cervical length, for which she was offered a cervical cerclage. During the procedure, a small polyp was incidentally discovered and removed for histological assessment. She had had several episodes of vaginal discharge necessitating

* Corresponding author at: Department of Pathology, Faculty of Medicine, 25, Kinsey Road, Colombo 08, Sri Lanka.
E-mail address: lalanidesilva7@gmail.com (L. De Silva).

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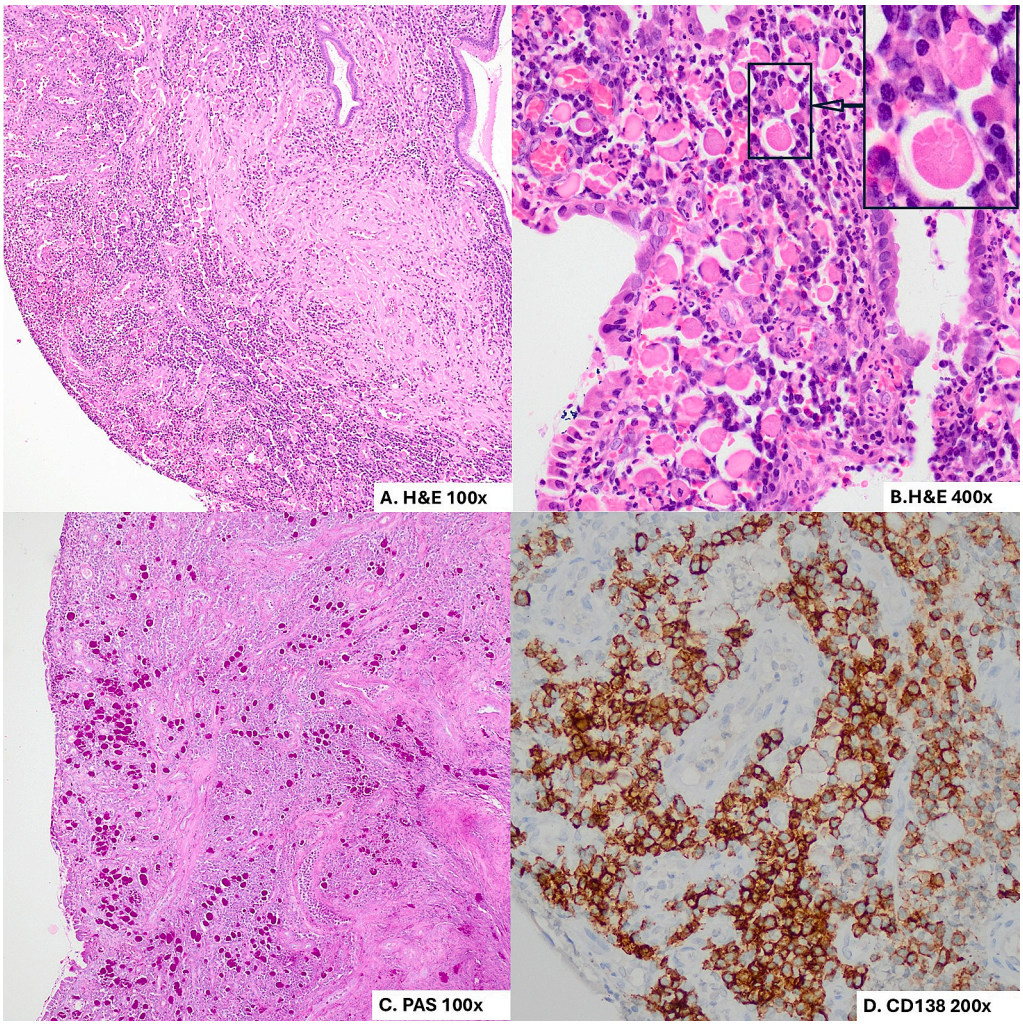

Fig. 1. Histology of cervical polyp. (A and B) Haematoxylin and eosin stain (H&E) shows dense inflammatory infiltrate within the stroma with scattered Russell bodies (A: H&E; 100× B: H&E 400×). The inset in 1B shows two Mott cells. (C) The large intracytoplasmic globules of Russell bodies are strongly positive with Periodic Acid Schiff stain (PAS; 100×). (D) Immunohistochemical staining shows strongly positive CD 138 (200×).

treatment for vaginal candidiasis. There is no associated pain, discomfort, or bleeding. She also denied any history of trauma, dyspareunia or vulval ulcers. She had had regular menstrual cycles prior to this pregnancy, and was not on any contraceptives. She reported no joint pain, skin rashes, bleeding tendencies, weight loss, loss of appetite or family history autoimmune disorders. On examination, there was no palpable peripheral lymphadenopathy or hepatosplenomegaly.

Routine blood investigations revealed normal haematological parameters. Antenatal screening for syphilis, *Chlamydia trachomatis, Neisseria gonorrhoeae*, and HIV was negative. There were no clinical features suggestive of herpes simplex virus (HSV) infection. Therefore, HSV serology was not tested. Routine antenatal ultrasound scans showed no foetal abnormalities.

The histopathological assessment of the cervical polyp revealed a single polyp measuring 7x6x6 mm. Microscopic evaluation showed an inflamed, ulcerated endocervical polyp with focal decidual changes in the stroma. The stroma was densely infiltrated by plasma cells, with numerous intracytoplasmic Russell bodies scattered throughout. Some cells contained multiple small globules, characteristic of Mott cells (Fig. 1A and B). These globules were strongly highlighted by Periodic Acid Schiff staining (Fig. 1C). There were no abnormal or neoplastic plasma cells within the infiltrate. The endocervical glandular epithelium displayed reactive features with no evidence of atypia. Plasma cells, including the ones with Russell bodies, were strongly positive for CD 138, confirming the diagnosis (Fig. 1D). Immunostaining for kappa and lambda light chains demonstrated a polyclonal infiltrate, ruling out the possibility of a neoplastic proliferation. Based on these findings, a diagnosis of Russell body cervicitis was made. The patient continued routine follow-up at the antenatal clinic for her otherwise uncomplicated pregnancy.

3. Discussion

The first documented evidence of what would later be called Russell bodies was produced by the British pathologist William Russell in the late nineteenth century. His paper termed them "fuchsine bodies", and they were mistakenly identified as a form of cancer-causing organism [9]. Research in the twentieth century unveiled the true nature of these structures as plasma cells [2,10]. It was later discovered that these structures develop within plasma cells in response to exposure to specific antigens [11]. Physiochemical properties of variable domains of immunoglobulin light and heavy chains determine the induction of Russell bodies. Their formation results from excessive protein production associated with impaired secretory properties, leading to the accumulation of protein products within the endoplasmic reticulum [12].

Plasma cell infiltration of the cervix is commonly seen in cases of chronic cervicitis, which may result from long-standing infections,

Table 1
Summary of cases reported as Russell body cervicitis.

No	Reference	Published Year	Age	Presentation	Histological appearance	Additional tests done
1	Stewart CJ [14]	2006	35	Cervical biopsy following routine cervical screening	The stroma showed a diffuse infiltrate of plasma cells with numerous variably sized cytoplasmic inclusions typical of Russell bodies	CD79a, CD138 Kappa/ Lambda-polyclonality
2	Altun E [15]	2017	40	HPV positivity with suspicious looking cervix	Dense plasma cell infiltrate with Russell bodies	–
3	Joseph D [16]	2020	44	Recurrent endocervical polyp	Endocervical polyp with Russell body cervicitis	CD138
4	Nimi Shabeer [17]	2021	41	Post-coital bleeding with a polyp	Endocervical polyp showing dense infiltrate of plasma cells with Mott cells and Russell bodies	CD138, Kappa /Lambda -polyclonality
5	Mangla M [18]	2024	34	Vaginal discharge with hypertrophied cervix	Intense plasma cell-rich inflammation with many of the plasma cells showing Russell bodies	–
6	Current case	2024	28	Incidental finding of a cervical polyp during pregnancy	Endocervical polyp with a dense infiltrate of Russell bodies	PAS -positive CD 138-positive with Kappa /Lambda polyclonality

chemical or mechanical irritation, or sexually transmitted infections such as HSV, *Treponema pallidum* (syphilis), *Chlamydia trachomatis* or *Neisseria gonorrhoeae*. It can also be associated with autoimmune conditions such as Sjögren syndrome, as well as plasma cell dyscrasias such as plasmacytoma or extra-nodal lymphoma. Currently, there are no established guidelines recommending a specific autoimmune evaluation solely based on the presence of Russell bodies. However, their presence may warrant further investigation depending on the clinical context. In the present case, given the association with recurrent candidiasis and lack of other systemic symptoms, an extensive autoimmune work-up was not initiated antenatally. Postpartum, a repeat evaluation was considered; however, the patient's symptoms had resolved, and no additional findings emerged to suggest an autoimmune process.

Cervicitis with predominant Russell bodies is exceedingly rare. The first documented cases of Rusell bodies in the cervix were reported by Munsick in 1963. His report included 2 cases of endocervical polyps with Russell bodies, although those were not specifically referred to as "Russell body cervicitis" at the time [13]. The term "Russell body cervicitis" was first proposed by Stewart in 2006, owing to its histopathological resemblance to Russell body gastritis [14]. Subsequently, a several case reports were published and there are five cases reported in the English literature to date [14–18] (Table 1).

Russell body cervicitis has predominantly been reported in women of reproductive age, with patients ranging from 28 to 44 years of age. Among these, three cases presented clinically as cervical polyps. One was reported in association with HPV infection. None of the published cases were associated with autoimmune conditions or other systemic illness. Clonality was assessed in three cases, all of which were confirmed to be polyclonal, supporting a reactive rather than neoplastic process. Clinical follow-up in all cases was uneventful.

Histopathological diagnosis can be challenging. The differential diagnoses include viral infections, malakoplakia, plasma cell dyscrasia, and some infiltrative malignancies such as signet ring cell carcinoma. Viral infections typically present with additional histological hallmarks specific to the pathogen. For example, the presence of multinucleated smudgy nuclei is characteristic of HSV, serving as a valuable diagnostic clue. Malakoplakia can also present a diagnostic challenge, but the identification of Michaelis-Gutmann bodies supports its diagnosis. The absence of abnormal plasma cells and the polyclonal nature of the infiltrate exclude the plasma cell neoplasms. The positivity for plasma cell markers such as CD138 and the negativity for epithelial markers support a plasma cell origin. However, caution is required as epithelial markers may be expressed in plasma cells and CD138 can be positive in some plasmacytoid carcinomas. Therefore careful interpretation of these findings is essential.

Differentiating Russell body cervicitis from other conditions requires a comprehensive clinical, serological, and microbiological evaluation to exclude chronic infections, autoimmune disorders, and underlying neoplastic processes. In the case reported here, there were no clinical or laboratory findings indicative of systemic infection, autoimmune disease, or malignancy. However, the presence of recurrent candidiasis is considered a likely contributor to chronic mucosal inflammation in this case. It is plausible that this persistent local infection played a role in triggering the inflammatory response and the subsequent formation of Russell bodies.

4. Conclusion

Russell body cervicitis is an uncommon condition, typically affecting women of reproductive age, with very few well documented cases in the medical literature. Although no direct connection has been made with underlying malignancies or autoimmune diseases in this population so far, careful evaluation is still important to exclude these possibilities. Given how rare this finding is, firm conclusions cannot be drawn from a single case. However, reporting such cases adds to the limited knowledge available and may help improve understanding and diagnosis.

Contributors

Lalani De Silva contributed to patient care, conception of the case report, acquiring and interpreting the data, drafting the manuscript and undertaking the literature review.

Kaumadi Udeshika contributed to patient care and acquiring and interpreting the data.

Sinha De Silva contributed to undertaking the literature review and revising the article critically for important intellectual content.

Priyani Amarathunga contributed to patient care and revising the article critically for important intellectual content.

All authors approved the final submitted manuscript.

Patient consent

Informed consent was obtained from the patient for publication of this case report and the accompanying histopathology images.

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Conflict of interest statement

The authors declare that they have no conflict of interest regarding the publication of this case report.

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