Bone Marrow Lesions in Q Fever

To the Editor:

Q fever, caused by *Coxiella burnetii*, is a systemic disease of worldwide distribution. Derrick in his original description put emphasis on the pulmonary involvement. Subsequently, several authors have also described hepatitis. However, bone marrow changes have received little attention. In 1957 Ende and Gelpi were the first to pay attention to the possibility of bone marrow lesions.

During the past 2 yr we observed 14 patients with positive complement fixation for Q fever. In 2 cases, bone marrow biopsy from the iliac crest was done and peculiar changes were present. In these 2 cases, laboratory studies showed the following:

**Case 1.** WBC 4500–6100/mm³, with 78% polymorphonuclear leukocytes (PMN), 1% eosinophils, 17% lymphocytes, 4% monocytes. There was also slight anemia (Hb 10.5 g/dl), normocytic, normochromic; reticulocytes 81,000.

**Case 2.** At the beginning of the disease leukocytosis was noted (WBC 10,200/mm³, with 92% PMN; Hb 12.7 g/dl). Twenty days later the WBC was 6100/mm³, with 55% PMN, 7% eosinophils, 1% basophils, 28% lymphocytes, 9% monocytes; Hb was 9.6 g/dl; reticulocytes 128,000. No platelet abnormality was noted in either case.

When bone marrow biopsy was performed patients were febrile and presented leukopenia and anemia. In both, hematopoietic tissue was hyperplastic and contained some mature plasmocytes. Above all, most of the bone marrow areas in the first case and only one or two areas per section in the second showed granulomatous nodules with several particularities (Fig. 1). These nodules were formed by histiocytes, sharing epithelioid features disposed around a lumen. Numerous PMN intermingled among the epithelioid cells and scarce multinucleated giant cells were encountered. The granulomas were encircled by a fibrinoid ring, quite visible after Masson

![Fig. 1. Isolated granuloma within bone marrow space. H&E. × 2.5. Inset: granuloma around lumen with peripheral fibrinoid ring. Trichrome stain. × 40.](image-url)
trichrome (deep red) and Mallory phosphotungstic acid hematoxylin (deep blue). In addition, fibrin thrombi were observed in some sinuses. Rickettsiae were not found. In these two patients similar changes were also noted in liver biopsies: granulomas with fibrinoid ring and fibrin thrombi.

Bone marrow changes in Q fever are not surprising because of the systemic distribution of the disease. These lesions, quite similar to those described by Ende and Gelpi, may be explained by the vascular tropism of Rickettsiae. The angitis could be responsible for the fibrin thrombi and fibrinoid ring. Nevertheless, after biopsies were cut serially we interpreted the lesion portrayed in the inset of Fig. 1 differently than they did. In our opinion the clear central space was not a vestigial vascular lumen but an adipocyte incorporated in the developing granuloma.

As the result of granuloma in Q fever, this disease has to be considered among the possible diagnosis of bone marrow granulomas. Nevertheless, the presence of the singular fibrinoid ring, within or around the granuloma, is a diagnostic aid for the pathologist.

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REFERENCES

TdT Activity in B Cell ALL

To the Editor:

It was with great interest that we have read the recent report in this journal by Shaw et al. Some caution, however, appears necessary before concluding an “association of TdT with immature and proliferating blast cells, rather than any specific differentiating pathway to B- or T-cell status.” Early studies by Harrison et al. clearly showed that TdT activity is independent of cell cycle status and thus not higher per se in proliferating cells. Regarding the technique of TdT determination, it ought to be kept in mind that the comparison of an assay for DNA polymerase β in purified form and in a crude cell homogenate could lead to some erroneous conclusions regarding specificity. Furthermore, ethanol and NEM, which were used to inhibit TdT activity, will also inhibit DNA polymerase α, which would be present in high amounts in the homogenate of proliferating cells. It has been reported that ATP specifically inhibits TdT without any effect on other DNA polymerases, and we have found this to be a most useful specificity control in our own studies of TdT levels in leukemia and lymphoma.

As mentioned by Shaw et al., the well-documented presence of a receptor for the Fc portion of IgG on some T cells or antibodies directed against the cell surface of the leukemic cells could very well account for the observed binding of IgG to the peripheral blood lymphocytes. It is unfortunate that these studies were carried out in the peripheral blood with only 42% blasts and not on a bone marrow sample. Moreover, an absolute value for the IgG serum spike, labeling of the cells after trypsinization and/or short-term culturing and the use of fluorochrome-tagged monovalent anti-x and F(ab')2 fragments of antibodies, and information about the IgG spike during remission and at relapse would have been helpful to determine the nature of this patient’s leukemia.

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Bone marrow lesions in Q fever [letter]

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