SHORT REPORT

Lack of CD34 positive stromal cells within angiomyomas (vascular leiomyomas)

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Aims: To investigate the role of CD34 positive stromal cells in the morphogenesis and tumour growth regulation of angiomyomas (vascular leiomyomas).

Methods: Histochemical analysis using monoclonal antibodies to CD34 and CD31 was performed in 10 angiomyomas and their adjacent soft tissue.

Results: CD34 positive stromal cells were not seen within the tumour tissue; the thick walled vessels within the tumours lacked CD34 positive stromal cells. In contrast, bundles of CD34 positive stromal cells were detected at the tumour border of all of the angiomyomas and in the adventitial tissue of the surrounding normal vessels.

Conclusions: The lack of CD34 positive stromal cells within an angiomyoma is associated with the characteristic morphology of an angiomyoma.

Immunostaining of CD34 using clones MY10 and QBEnd10 showed the same results in all of the 10 tumours. We examined CD31 immunoreactivity in all of the tumours, to distinguish CD34 positive stromal cells from CD31 positive vascular endothelial cells.⁴ We considered CD34 positive and CD31 negative cells to be CD34 positive stromal cells.⁴

RESULTS

As reported previously,¹ CD34 positive stromal cells were detected in the vascular adventitial tissue (fig 1A and B). No CD34 positive stromal cells were detected within the tumours (fig 1A and B); the thick walled vessels within angiomyomas were not surrounded by CD34 positive stromal cells (fig 1A and B). Within the tumours, CD34 was positive only in endothelial

Human progenitor cell antigen (CD34) positive stromal cells¹ are distributed throughout the human body, including the dermis.² CD34 positive stromal cells are thought to play a supportive role in adjacent mesenchymal and epithelial cells.¹

In the soft tissues of the human body, CD34 positive stromal cells surround vascular structures, nerves, and muscle bundles. Angiomyomas (vascular leiomyomas) are composed of several thick walled vessels. To elucidate the role of CD34 positive stromal cells, it is important to examine whether or not thick walled vessels within angiomyomas are surrounded by CD34 positive stromal cells.

In soft tissue tumours, no studies have been performed to investigate the presence of CD34 positive stromal cells at the tumour border. In benign nerve sheath tumour tissues (neurofibromas and schwannomas), CD34 positive stromal cells were confirmed by immunohistochemical analysis, and are thought to have a supportive function in these tumours.³

In our present study, we examined CD34 positive stromal cells within the tumours and at the tumour border, to elucidate the role of CD34 positive stromal cells in angiomyomas.

MATERIALS AND METHODS

We examined 10 surgically resected angiomyomas, all of which were located in the deep dermis and subcutaneous tissue; nine were located in the extremities. The tumours ranged in size from 0.5 to 1.4 cm. All of the 10 tumours were well demarcated and composed of numerous thick walled vessels. Immunohistochemical studies were performed using a Histofine SAB-PO (multi) kit (Nichirei, Tokyo, Japan). The following monoclonal antibodies were used: anti-CD34 (clone MY10; Becton-Dickinson, San Jose, California, USA, and clone QBEnd10; Dakopatts, Glostrup, Denmark) and anti-CD31 (clone JC/70A; Dakopatts). All 10 tumours were immunostained with the two anti-CD34 monoclonal antibodies.

Figure 1 Immunostaining for (A) CD34 and (B) CD31 within and outside the tumour. CD34 positive stromal cells showing a bundle formation (CD34 positive and CD31 negative) are seen at the tumour border and in the surrounding normal tissue (especially perivascular areas), but are not seen within the tumour. CD34 and CD31 are positive only in the endothelial cells within the tumour. T, tumour tissue; N, normal tissue.

Take home messages

- CD34 positive stromal cells were not seen within the tumour tissue, although bundles of CD34 positive stromal cells were detected at the tumour border of all of the angiomyomas and in the adventitial tissue of the surrounding normal vessels
- The lack of CD34 positive stromal cells within an angiomyoma is associated with the characteristic morphology of an angiomyoma
- The absence of CD34 expression is associated with pathological conditions

cells lining the vascular lumen. At the borders of all 10 tumour, bundles of spindle stromal cells were detected (fig 1A and B).

DISCUSSION

Angiomyomas (vascular leiomyomas) are benign soft tissue tumours, which cause few problems apart from pain.⁵ Angiomyomas are composed of thick walled vessels, so that they are excellent models for elucidating the role of perivascular CD34 positive stromal cells, namely adventitial fibroblastic cells. It is also important to examine the tumour border of angiomyomas, because no studies have yet been performed at the borders of soft tissue tumours.

"Angiomyomas may originate in vessel walls, and the thick walled vessels within angiomyomas may be different from normal vessels"

Angiomyomas are believed to arise from the vessel walls in subcutaneous soft tissue and/or the deep dermis.⁶ In our present study, CD34 positive stromal cells were detected at adventitial areas of vessels in subcutaneous normal soft tissue, indicating that perivascular CD34 positive stromal cells are adventitial fibroblastic cells. CD34 positive stromal cells were detected at the tumour border, but not within the tumours. These results suggest that angiomyomas may originate in vessel walls, and that the thick walled vessels within angiomyomas are different from normal vessels.

The absence of CD34 expression is associated with pathological conditions. Regarding the tumour stromal cell reaction, both colorectal tumour stroma and peritumoral inflammatory tissue lack CD34 positive stromal cells.⁷ There is a possibility that the lack of CD34 positive stromal cells within angiomyomas is associated with the characteristic tumour morphology.

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