<table>
<thead>
<tr>
<th>Title</th>
<th>Angiosarcoma of the scalp successfully treated with pazopanib</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author(s)</td>
<td>Tomita, Hajime; Koike, Yuta; Asai, Misachi; Ogawa, Fumihide; Abe, Kuniko; Tanioka, Miki; Utani, Atsushi</td>
</tr>
<tr>
<td>Citation</td>
<td>Journal of the American Academy of Dermatology, 70(1), pp.e19-e21; 2014</td>
</tr>
<tr>
<td>Issue Date</td>
<td>2014-01</td>
</tr>
<tr>
<td>URL</td>
<td><a href="http://hdl.handle.net/10069/34083">http://hdl.handle.net/10069/34083</a></td>
</tr>
<tr>
<td>Rights</td>
<td>© 2013 American Academy of Dermatology, Inc. Published by Mosby, Inc. All rights reserved.; NOTICE: this is the author's version of a work that was accepted for publication in Journal of the American Academy of Dermatology. Changes resulting from the publishing process, such as peer review, editing, corrections, structural formatting, and other quality control mechanisms may not be reflected in this document. Changes may have been made to this work since it was submitted for publication. A definitive version was subsequently published in Journal of the American Academy of Dermatology, 70, 1 (2014)</td>
</tr>
<tr>
<td>NAOSITE: Nagasaki University’s Academic Output SITE</td>
<td><a href="http://naosite.lb.nagasaki-u.ac.jp">http://naosite.lb.nagasaki-u.ac.jp</a></td>
</tr>
</tbody>
</table>
A case report of angiosarcoma of the scalp successfully treated with pazopanib

Hajime Tomita¹, Yuta Koike¹, Misachi Asai¹, Fumihide Ogawa¹, Kuniko Abe², Miki Tanioka³, Atsushi Utani¹

¹Department of Dermatology, Nagasaki University Graduate School of Biomedical Sciences, Nagasaki; ²Department of Pathology, Nagasaki University Hospital, Nagasaki; ³Department of Dermatology, Kyoto University Graduate School of Medicine, Kyoto

Address correspondence and reprint requests to Dr. Atsushi Utani, Department of Dermatology, Nagasaki University Graduate School of Biomedical Sciences, 1-7-1 Sakamoto, Nagasaki, 852-8501, Japan.
Phone: +81-95-819-7333
Fax: +81-95-849-7335
E-mail: utani@nagasaki-u.ac.jp

Manuscript word count: 472
Figure count: 2
References count: 4

The authors declare that they have no conflict of interest.
To the Editor: Angiosarcoma of the scalp has one of the worst prognoses among malignant skin tumors. Standard treatment guidelines for angiosarcoma do not currently exist. To the best of our knowledge, this is the first case of angiosarcoma of the scalp that responded significantly to oral pazopanib administration.

A 63-year-old man presented with scalp tumors that had developed two months before. Histopathologic examination revealed atypical, hyperchromatic endothelial cells, which were positive for CD31, CD34, D2-40, and VEGFR2, and formed vascular channels. The two tumors, 60 and 20 mm in diameter, were excised with negative surgical margins; however, four additional surgical operations were required to remove multiple recurrences. Subsequently, weekly docetaxel (25 mg/m², on days 1, 8, and 15, and every 4 weeks thereafter) was administered at 8 months after initial onset, but failed to suppress the development of further cutaneous tumors. Therefore, intravenous recombinant interleukin-2 (7 × 10⁵ U/day) combined with a 100-Gy electron beam irradiation was administered for 11-18 months after onset. However, new tumors grew outside the area of irradiation. At 18 months after onset, multiple ulcers were visible on the patient’s scalp, a 30 × 20 mm indurated plaque on
the left cheek, marked edema of the face (Fig. 1A), and the involvement of multiple cervical, mandibular, and intraparotid lymph nodes (Fig. 2A).

Owing to the refractory tumors, pazopanib treatment was initiated at a dose of 800 mg once daily. At day 3 of pazopanib treatment, edema of the face began to subside, and the patient began to open both eyes; the edema finally disappeared by day 14. The left cheek indurated plaque completely disappeared (Fig. 1B). In addition, a computed tomography scan at day 19 showed shrinking of the multiple cervical, mandibular, and intraparotid lymph nodes (Fig. 2B). Toxic side effects of grade 3 thrombocytopenia and grade 2 neutropenia were apparent. Pazopanib therapy was discontinued two weeks and restarted at a reduced dose of 600 mg once daily. Thereafter, grade 3 proteinuria required dose reduction of 400 mg once daily. However, partial tumor reduction was maintained for 24 weeks and the patient is now undergoing a pazopanib treatment without toxic side effects.

Pazopanib is a multi-targeted receptor tyrosine kinase inhibitor of VEGFR-1, VEGFR-2, VEGFR-3, PDGFR-a/β, and c-kit. VEGFR-2 have been found to be up-regulated in angiosarcoma. Angiosarcoma cells in the present case were also
positive for VEGFR-2, suggesting that the signal through VEGFR-2 stimulates tumor.

Accordingly, it is possible that pazopanib leads to clinical improvement by inhibition of VEGFR-2 tyrosine kinase activity.

The present case showed the rare toxic effects. It is possible that taxane chemotherapy contributed to these toxic effects.

Other VEGFR inhibitors (bevacizumab, sorafenib, and sunitinib) have also been reported to be effective treatments for angiosarcoma. Thus, VEGFR inhibitor, including pazopanib, may be an additional optional for treating angiosarcoma.


Figure legends

Figure 1: Improvements in edema and erythema and reduction in the left cheek indurated plaque are seen following pazopanib therapy. (A) Before pazopanib therapy. (B) 14 days after commencement of pazopanib therapy.

Figure 2: Serial computed tomography scans. Scans show varying responses in multiple intraparotid lymph nodes (arrows). (A) Before pazopanib therapy. (B) 19 days after commencement of pazopanib therapy.