Retropharyngeal longitudinal low density in Kawasaki disease; CT features and differentiation from other diseases.

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Learning objectives

To learn characteristic CT features of retropharyngeal low density in Kawasaki disease. In this exhibit, we also present other diseases such as retropharyngeal abscess and lymph adenitis demonstrating retropharyngeal low density.
Background

Kawasaki Disease is characterized by systemic vasculitis affecting most frequently infants and young children under 5 years of age. Clinical diagnosis is made based on a criteria with certain symptoms and other findings. This criteria includes fever that lasts for five or more days, bilateral conjunctival congestion, changes of lips and oral cavity, polymorphous exanthema, changes of peripheral extremities and acute non-purulent cervical lymphadenopathy.

Neck computed tomography (CT) may be obtained for evaluating swelling lymph nodes. In Kawasaki disease, we frequently experience low density area in retropharyngeal space that mimicks retropharyngeal abcess. Some literatures reports that this finding is not always specific to Kawasaki disease, but this is may be associated with Kawasaki disease and gives awareness of being suspicious of Kawasaki disease.
We investigated retrospectively cases with neck CT scan taken by pediatrician and we extracted the cases diagnosed with Kawasaki disease January 2005 to December 2011. We had 36 cases diagnosed as Kawasaki disease on the basis of the diagnosis criteria.

In about 70% (26 out of 36 cases) patients of Kawasaki disease, neck CT demonstrates longitudinal and symmetric low density in retropharyngeal space (Figure 1 and 2). We also evaluate the craniocaudal range in 36 cases. Most of the cases range superior margin of thyroid gland from lower margin of the submaxillary gland.

This retropharyngeal low density is similar to findings of retropharyngeal abscess so that unnecessary, invasive treatment such as drainage tube insertion may be done.

Multi-planer construction sagittal imaging with MDCT shows longitudinal low density that is situated in retropharyngeal space. We also evaluate the craniocaudal range in 36 cases. In most of the cases, vertical low density range from upper level of thyroid gland to lower level of submaxillary gland, about 2-4 cm (figure 2).

What corresponds to Retropharyngeal low density?

Low density within retropharyngeal space is considered to be due to altered lymphatic drainage or excess lymph production, which is seen in inflammatory condition.

Also in our experience, we usually see a case with retropharyngeal low density, which disappeared after resolution of inflammation in Kawasaki disease (figure 3 and 4). This seems to give an implication that retropharyngeal low density is due to inflammation. However, some severe cases diagnosed as suppurative lymphadenopathy seems to lack of retropharyngeal low density.

What are other diseases associated with retropharyngeal low density?

Retropharyngeal space contains fat and lymph node. It is situated in the midline posterior to the pharynx and extends from the skull base to the level of T-2 to T-6.

Several pathogenesis of retropharyngeal low density are inflammatory changes, tumors, pseudotumors and posttraumatic. Inflammatory changes include reactive adenopathy, suppurative adenopathy abscess. Considering age of patients affected by Kawasaki disease, malignant tumors are unlikely possibility.

Possible differential diagnosis are suppurative adenopathy and abscess.
**Supprative lymph adenopathy**

We present a case of supprative lymphadenopathy with low density (Figure 5), however in another case of supprative lymphadenopathy, there is no low density in retropharyngeal space (Figure 6). Compared with Kawasaki disease, Supprative lymphadenopathy has obviously lower rate of accompanying low density in retropharyngeal space.

**Retropharyngeal abscess**

Retropharyngeal abscess is deep neck infection resulting from upper respiratory system and spread to cervical lymph nodes. Supprative lymph nodes collapsed lead to abscess. CT scan shows low density area in retropharyngeal space with border irregularity and rim enhancement.

These findings are less associated with retroparyngeal low density area in Kawasaki disease. Retropharyngeal abscess extends to adjacent space such as prevertebral space and carotid space. Therefore, mass effect is usually seen. This finding is not usually seen in Kawasaki disease.

Retropharyngeal abscess can cause air way obstruction, mediastinitis and carotid artery aneurysm that are significant morbidity and mortality. Unless antibiotic treatment is effective, Surgical drainage is required to avoid life-threatening condition. It is recommended that repeat imaging is performed in patients with retropharyngeal adenitis if no clinic improvement is seen in 24 to 48 hours despite administration of antibiotics.

**Characteristic imaging findings of retropharyngeal low density in Kawasaki disease**

Characteristic imaging findings of retropharyngeal low density in Kawasaki disease are as follows

- symmetric
- no rim enhancement
- no mass effect
- range vertically from upper level of thyroid gland to lower level of submaxillaly gland
Fig. 1: Lateral projection of the neck in a 3-year-old girl shows swelling retropharyngeal soft tissue. This swelling is evaluated by the maximum ratio of retropharyngeal tissue to body of C2. She was diagnosed as Kawasaki disease.

Fig. 2: Contrast-enhanced axial CT scan shows symmetric low density area within retropharyngeal space with no rim enhancement in 5-year-old girl with fever and lymph adenopathy. After admission, she was diagnosed as Kawasaki disease.
Fig. 3: She was diagnosed as Kawasaki disease 3 days after the admission. High fever improved with intravenous antibiotics. 8 days after the admission, neck CT scan was performed again. CT scan shows that low density in retropharyngeal has disappeared.
Fig. 4: Another case of Kawasaki disease diagnosed 4 days after onset of high fever and cervical lymph adenopathy. She was treated with intravenous immunoglobulin and oral acetylsalicylic acid. Retropharyngeal density has disappeared after treatment.

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**Fig. 5:** Contrast-enhanced axial CT shows left lymphadenopathy in 7-year old girl with torticollis. Low density in retropharyngeal space without rim enhancement.

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**Fig. 6:** Another case of suppurative lymph adenopathy with arrow heads in a 2-year-old girl. There is no low density area in retropharyngeal space. As in this case, retropharyngeal low density is not usually seen.

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Fig. 7: Contrast-enhanced CT scan shows irregular retropharyngeal abscess with mediastinitis in 5-year-old girl. It is estimated that left-sided suppurative lymph node capsule collapsed and purulent material extends to retropharyngeal space. In this case, surgical drainage was done and necrotic tissue was removed.

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Conclusion

In neck CT study of Kawasaki disease, about 70% patients demonstrate characteristic vertical low density in retropharyngeal space. This finding is may be associated with Kawasaki disease and gives the chance of considering the possibility of Kawasaki disease. We should avoid unnecessary treatment with knowledge of differentiating features from abscess and lymphadenitis.
References


