

# Surprise: High incidence of vein insufficiency in children

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## BACKGROUND

Newer studies on the onset of intra- and epifascial venous disease show three major components (fig. 1): 1) Congenital valve lesions, 2) pressure-induced valve decompensation, 3) stasis-induced inflammatory valve degeneration, furthermore phlebitis as an accelerator.

As congenital vein valve damage is the first to occur in people's life, it is basically important in the formation of a primary pattern of venous disease, determining the individual course.<sup>1</sup>

## AIM

To determine the incidence of early stages of epifascial venous insufficiency in children.

## METHODS

Using high frequency ultrasound systems (Siemens Juniper, Zonare One Pro, Mindray M9, 16 - 23 MHz; Vevo MD, 16 - 32 MHz), we examined 204 legs of 102 children and adolescents aged 6 – 18 (mean 12.5 years), 59 f, 43 m, all asymptomatic.

Investigation time was limited to 15 minutes. In case of visible vein changes (protruding, more intense color, increased diameter), ultrasound started in this location. Otherwise, systematic screening of saphenous veins and typical perforator locations was performed under flow induction by calf compression and walking simulation.

## RESULTS

71/102 children (58.8%), resp. 60/204 legs (34.8%) showed relevant venous pathology.

Lesions were mainly located in the GSV: 60/204 (29.4%), versus primary saphenous side branch varices (3.9%, fig. 3), SSV (3.4%), and perforator veins (1.0%). GSV at the lower leg showed 61.0% of all relevant lesions.

In the subgroup of 6-8 y/o kids, 11/23 kids (47.8%) already showed detectable relevant pathology (fig. 2).

The distance of reflux, relative to body height, correlates with the number of diseased valves in a row (criterion of severity, fig. 3). 42.3% of all cases were related to a single valve failure. Complete reflux was rare (4.3%).

Among these, unilateral commissural mismatch was the most frequent pattern (65.0%, fig. 3).

Fig. 2: Lesions in 6 – 8 year-old kids (46 legs)

|                                          |              |              |
|------------------------------------------|--------------|--------------|
| GSV focal reflux (2 - 10 cm)             | 3/46         | 6.5%         |
| GSV segmental reflux (> 10 cm)           | 5/46         | 10.9%        |
| GSV total reflux                         | 2/46         | 4.3%         |
| SSV focal reflux (2 - 10 cm)             | 0/46         | 0.0%         |
| SSV segmental reflux (> 10 cm)           | 0/46         | 0.0%         |
| SSV total reflux                         | 1/46         | 0.6%         |
| - with varix (no extra count)            | 5/46         | 10.9%        |
| Saphenous sidebranch reflux only         | 3/46         | 7.6%         |
| Perforator reflux associated to GSV, SSV | 2/46         | 4.3%         |
| <b>Legs with venous pathology, total</b> | <b>16/46</b> | <b>34.8%</b> |
| <b>Kids with venous pathology:</b>       | <b>11/23</b> | <b>47.8%</b> |

Fig. 3: Distance of reflux relates to number of involved valves

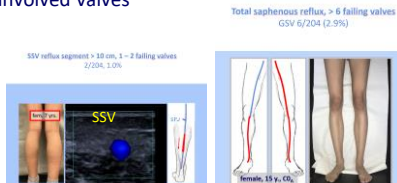


Fig. 1 The Three Primary Causes of Venous Insufficiency

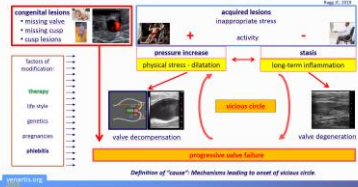
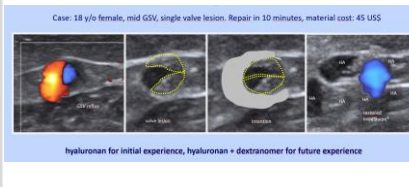


Fig. 4



## CONCLUSIONS

The unexpected high incidence of detected valve lesions in children, in particular the younger ones, should be best explained by congenital disease. It is a merit of today's ultrasound systems that even small lesions now can be detected.

It may be estimated that just about half of the young kids' lesions are a basis for later-on severe disease (CEAP C2-C6) while others stay subclinical (C0,C1).

Most of these cases seem treatable with just 1 – 2 punctures, like ablation of side branch lesions: (microfoam) or GSV/SSV (biomatrx sclerofoam). Even more important, vein-preserving valve repair methods like hyaluronan-dextranomer valvuloplasty (fig. 4) are currently under evaluation<sup>1</sup>.

Next studies will have to show which candidates might benefit from early detection, preventive measures, or a cost-effective therapy during or after adolescence.

## REFERENCES

<sup>1</sup> Ragg J.C. et al. Diagnosis of and Therapy for Vein Insufficiency in Children JVS-VL 2019, 7(2), 305–306

## DISCLOSURES

No funds received for study, travel or presentation.

## Contact information

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