Squat Echocardiography in Tetrology of Fallot : A new "Dynamic –Echo" modality to assess the hemodynamics and predict spells !

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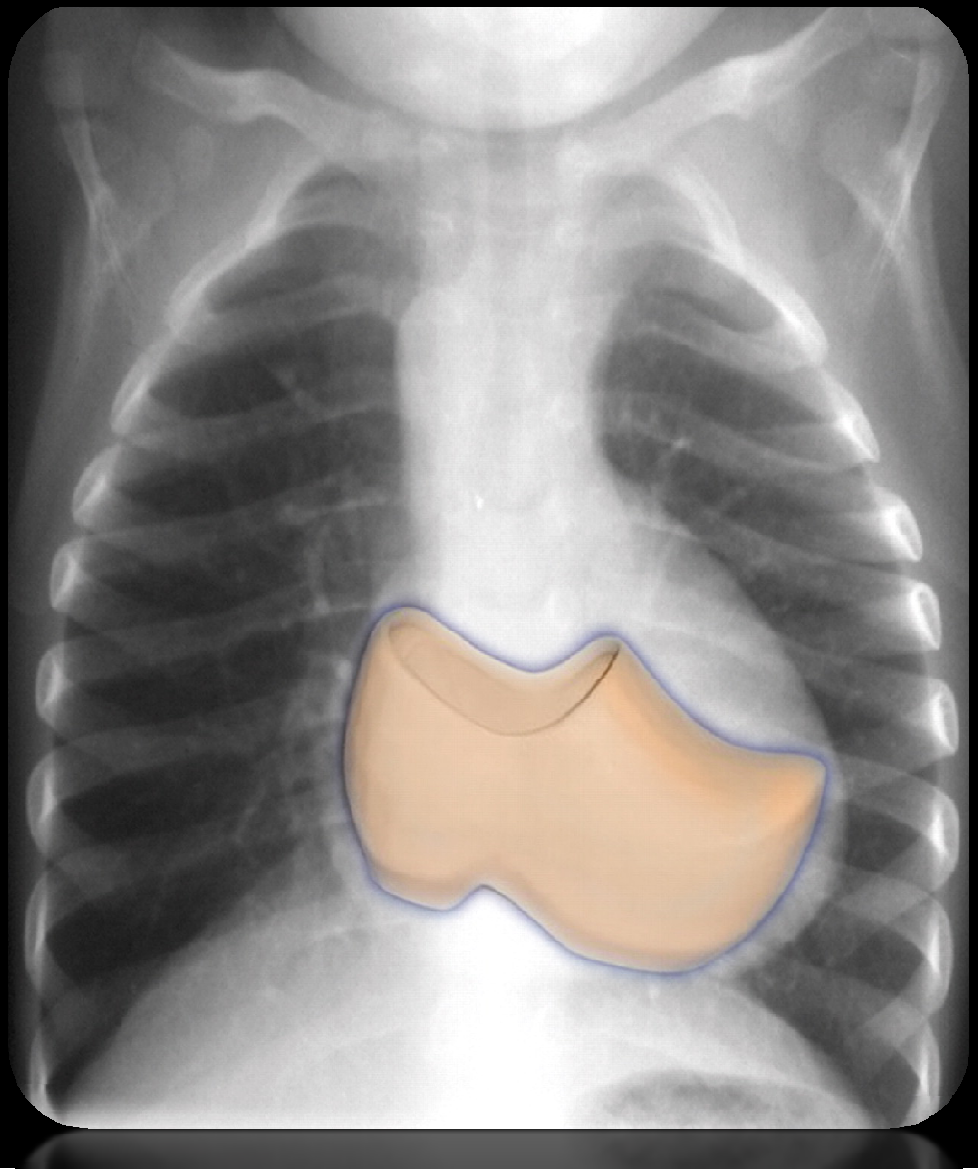
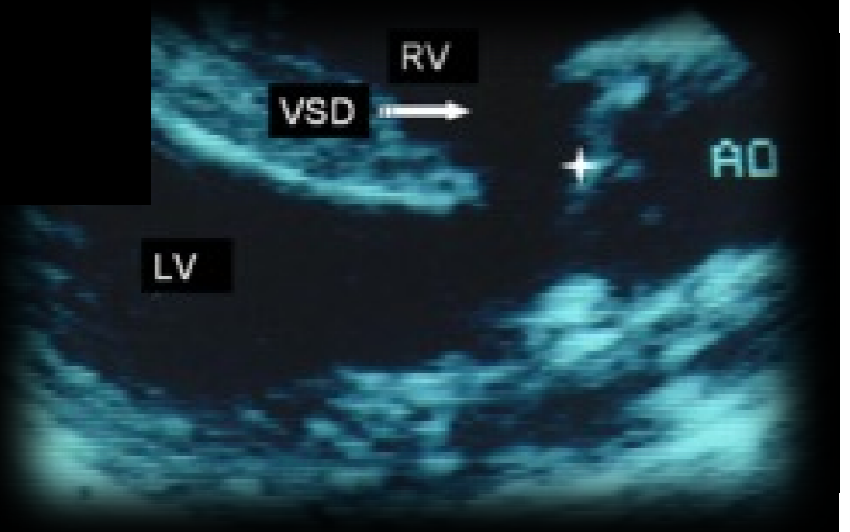
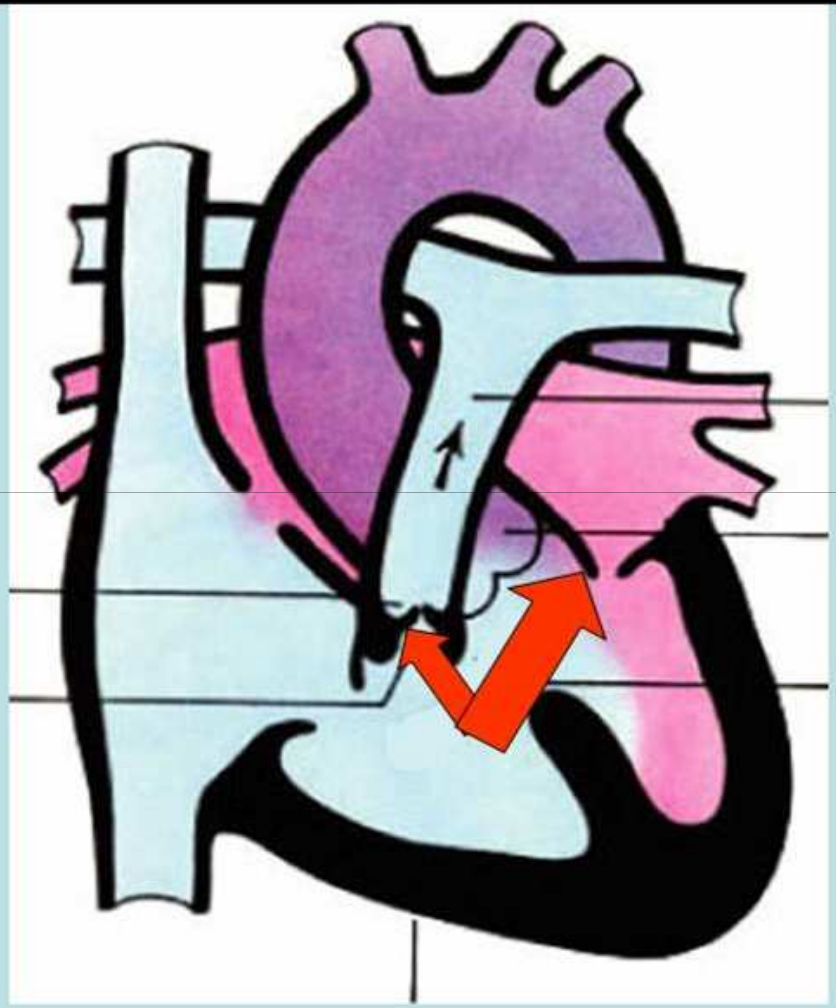
Newer insights about Echodyanmics in TOF !





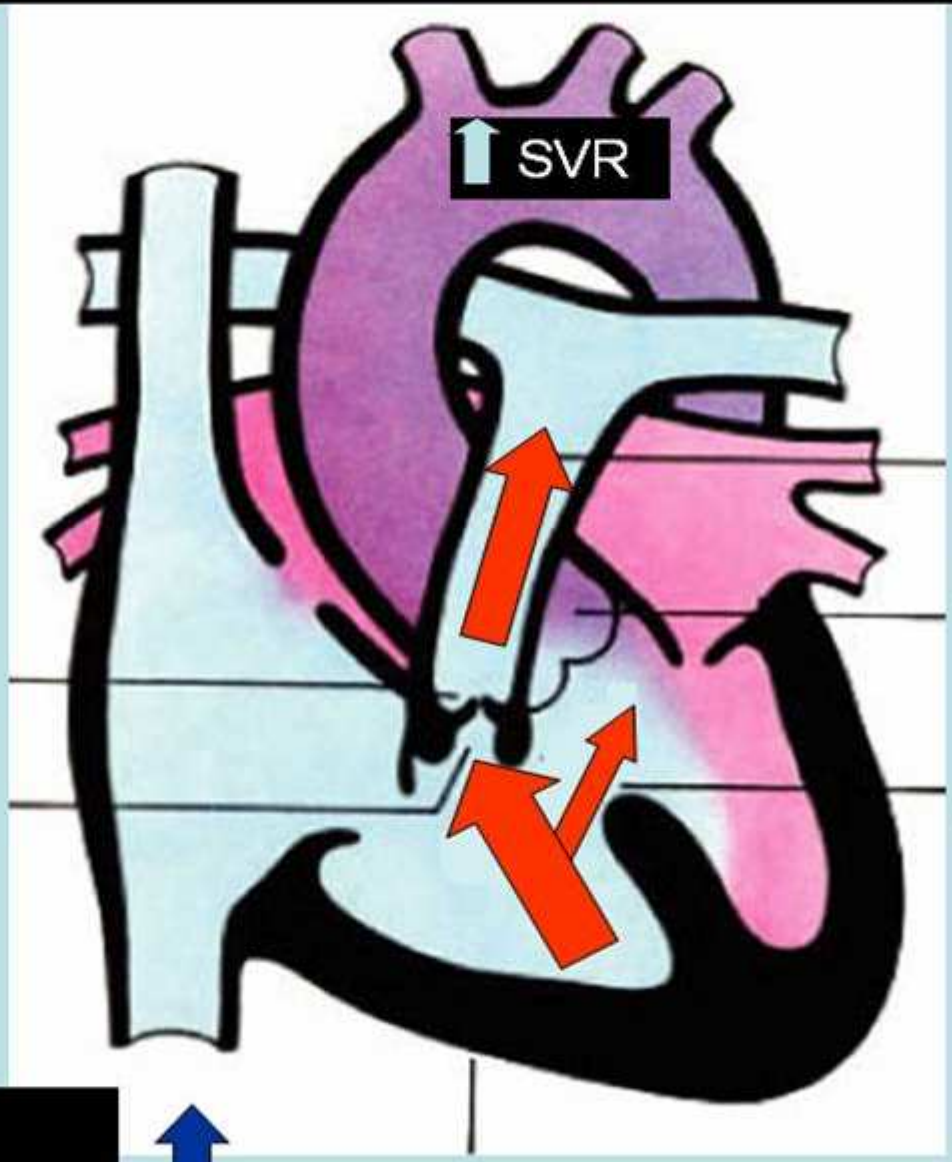
Tetrology of Fallot – Before squatting



Reduced pulmonary flow

Increased aortic flow

Tetrology of Fallot – After squatting



Increased pulmonary flow

Reduced aortic flow

Increased venous return (sustained squatting)

Concept and study methods

In over 5o years of clinical echocardiography , little data of intra cardiac blood flow during squatting is available!

We postulated that doppler can be an useful tool to assess the reduction in R –L shunt during squat .

Concept and study methods

In this context dynamic echocardiography was performed five patients with TOF .

Echo was done in basal standing posture and on sustained squatting . In one patient echo was performed during a spell .

The following parameters were measured. Apart from routine measurements (*RVOT flow , Aortic flow velocity , shunt across VSD were recorded)*

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Observation (Echo findings from standing to squatting)

The mean gradient of RVOT reduced from 68 to 46mmhg .

The aortic flow velocity reduced from 1.3 to 1m/sec .

In absolute terms the RVOT gradient regressed by 28-42% and aortic flow velocity reduced by 20 -30% .

The RA, RV dimension marginally Increased .

Further observations . . .

- The shunt across the VSD was assessed using *color M mode imaging .* It showed distinct change in the normal bi- modal shunt pattern with a new color streak from LV to RV.

- There was *no significant* increase in the left heart chamber dimension. It was difficult to get the accurate gradient across RVOT during a spell.

- One patient who failed to show squatting induced reduction of RVOT gradient , *later developed a spell* within 48 -72 hours

Conclusion

Squat Echocardiography is a "A simple modality" to study the intricacies of hemodynamics during squatting in TOF . Further , It can be useful in . . .

1. Grading the dynamic RVOT obstruction.
2. Predict impending hypoxic crisis .
3. Suggest surgical prognosis.
4. Assess the therapeutic response .

Key Messages to Forget !

Failure of squat induced reduction of aortic gradient *predicts* an impending spell or imply severe forms of TOF.

A minimum of 25 % reduction of RVOT gradient / aortic flow velocity *is expected* on squatting.

This response suggests RVOT anatomy is *less vulnerable* for hypoxic crises and possibly a better surgical outcome .

Thank you . . .for your time

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