

Leg raise effect on pressure in LES and UES

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KEY WORDS: high resolution manometry, gastroesophageal reflux disease; diaphragm, leg raise

OBJECTIVE: The purpose of this study is to determine the relation between increase of intraabdominal pressure, activity of crural diaphragm and changes in lower/upper esophageal sphincter pressure in patients with gastroesophageal reflux disease. We used High Resolution Manometry to measure pressure changes in lower and upper esophageal sphincter during bilateral leg raise (postural meneuvre). We also examined whether the rate of lower and upper esophageal sphincter pressures would increase during leg raise differentially in individuals with versus without normal resting pressures.

METHODS: 58 patients (aged 20 to 66, 32 males and 26 females) with GERD participated in the study. High resolution manometry was performed in relaxed supine position, then lower and upper esophageal sphincter pressures were measured. Finally, the patiens were instructed to keep their legs lifted performing 90 degrees flexion at the hips and knees (triple flexion) and the pressure was measured again. Paired t=test and independent samples t=test were used.

RESULTS: There was a significant increase both in lower (P<0.001) and upper esophageal sphincter pressures (P=0.035) during leg raise compared to the initial resting position.

LESP: The average resting LES pressure was 13,6 mmHg (SD 9,5). There was a significant increase in LES pressure during the triple flexion: 30,5 mmHg, (SD 18,2) P<0.001

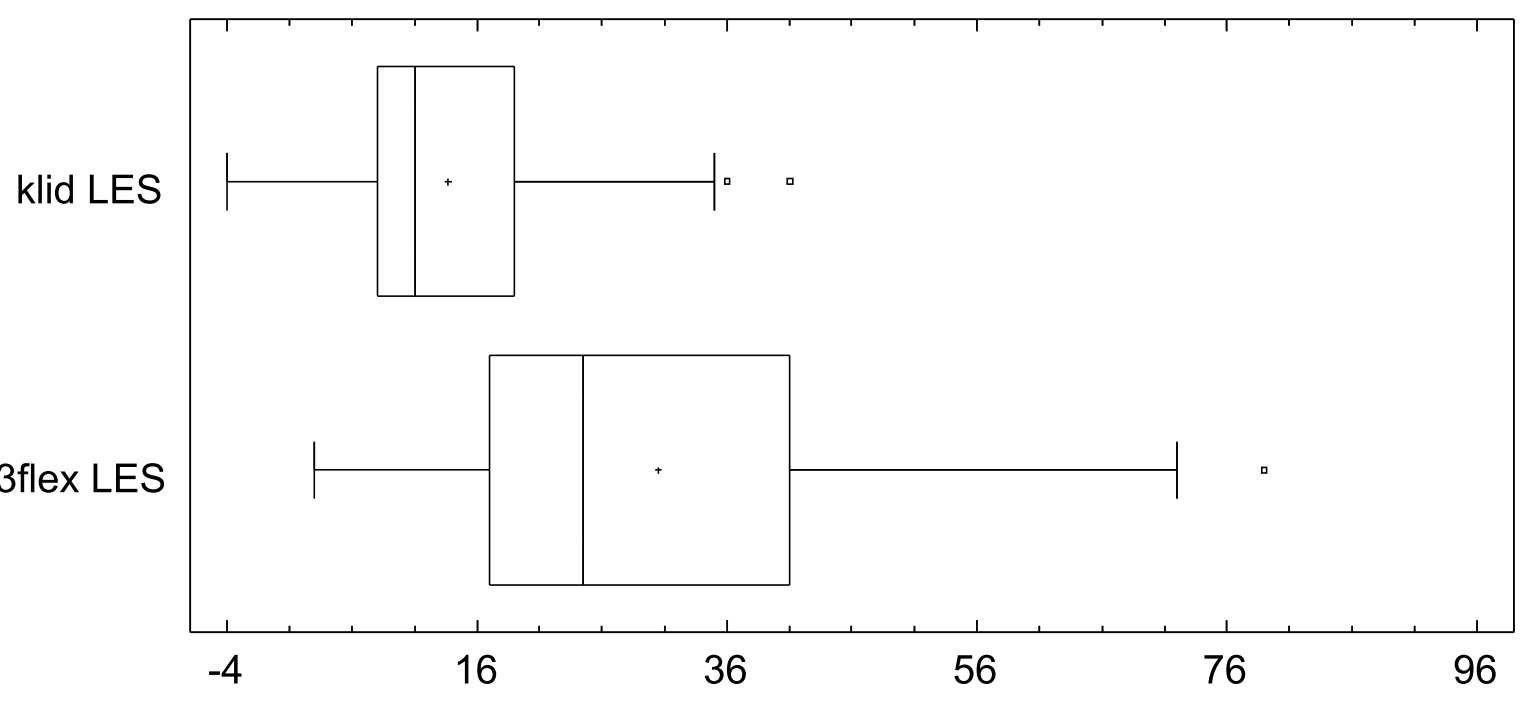
UESP: The average resting UES pressure was 89,6 mmHg (SD 67,8). There was a significant increase in UES pressure during the triple flexion: 103,7 mmHg (SD 78,4) P=0.034

Individuals with initially higher pressure in lower esophageal sphincter (>10 mmHg) exhibited a greater increase during leg raise, than those with initially lower pressure (pressure?10 mmHg; P=0.002).

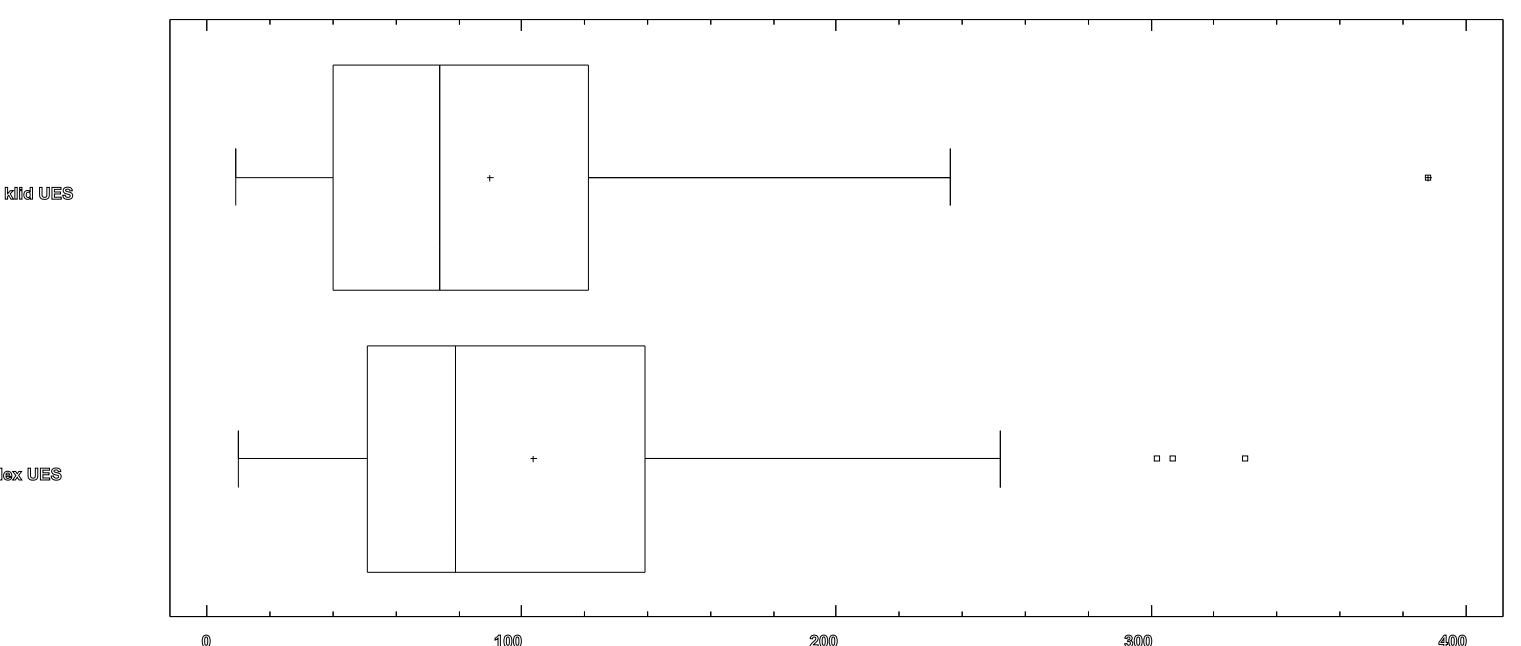
Similarly individuals with higher resting upper esophageal sphincter pressure (>44mmHg) showed a greater increase during leg raise, than those with lower resting pressure (?44 mmHg; P<0.001).



Fig. 1. Triple flexion (leg raise)



Tab.1



Tab.2

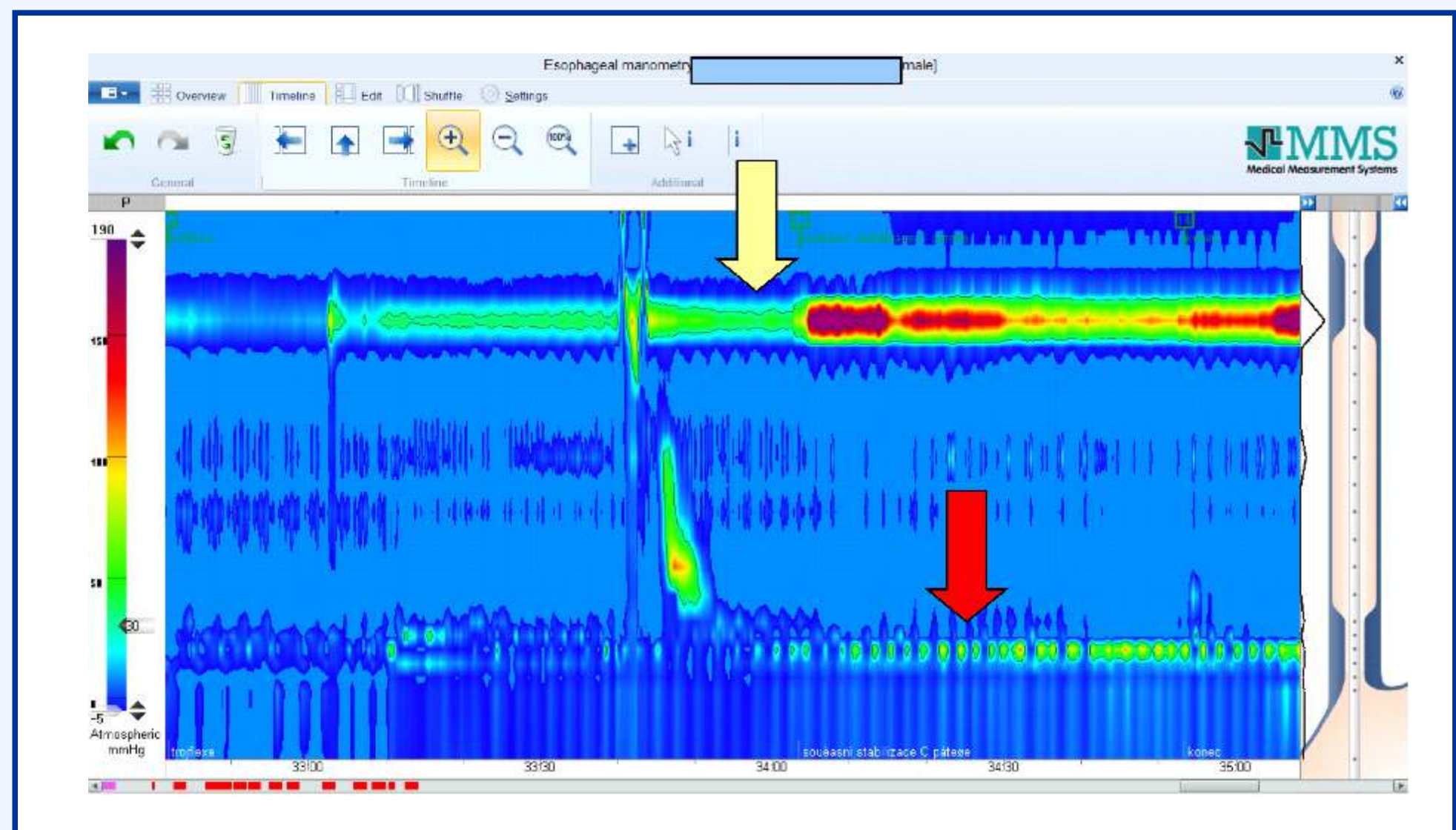


Fig. 2. Reactions of esophagus during triple flexion. Yellow arrow: shows the change in UES at the start of 3flexion Red arrow: shows the change in LES at the start of 3flexion.

Fig. 3. Reactions of esophagus during triple flexion. Yellow arrow: shows the change in UES at the start of 3flexion Red arrow: shows the change in LES at the start of 3flexion.

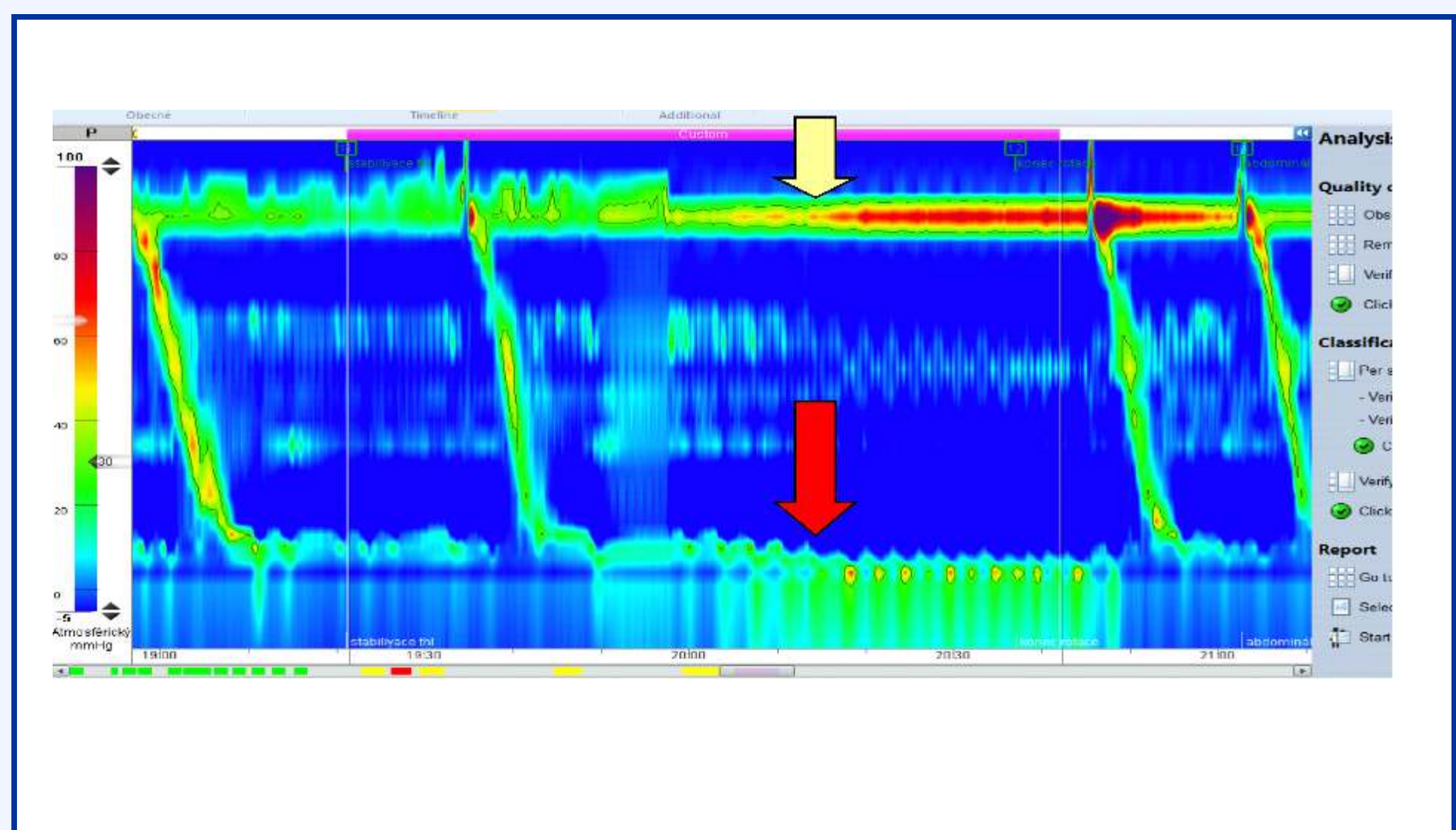
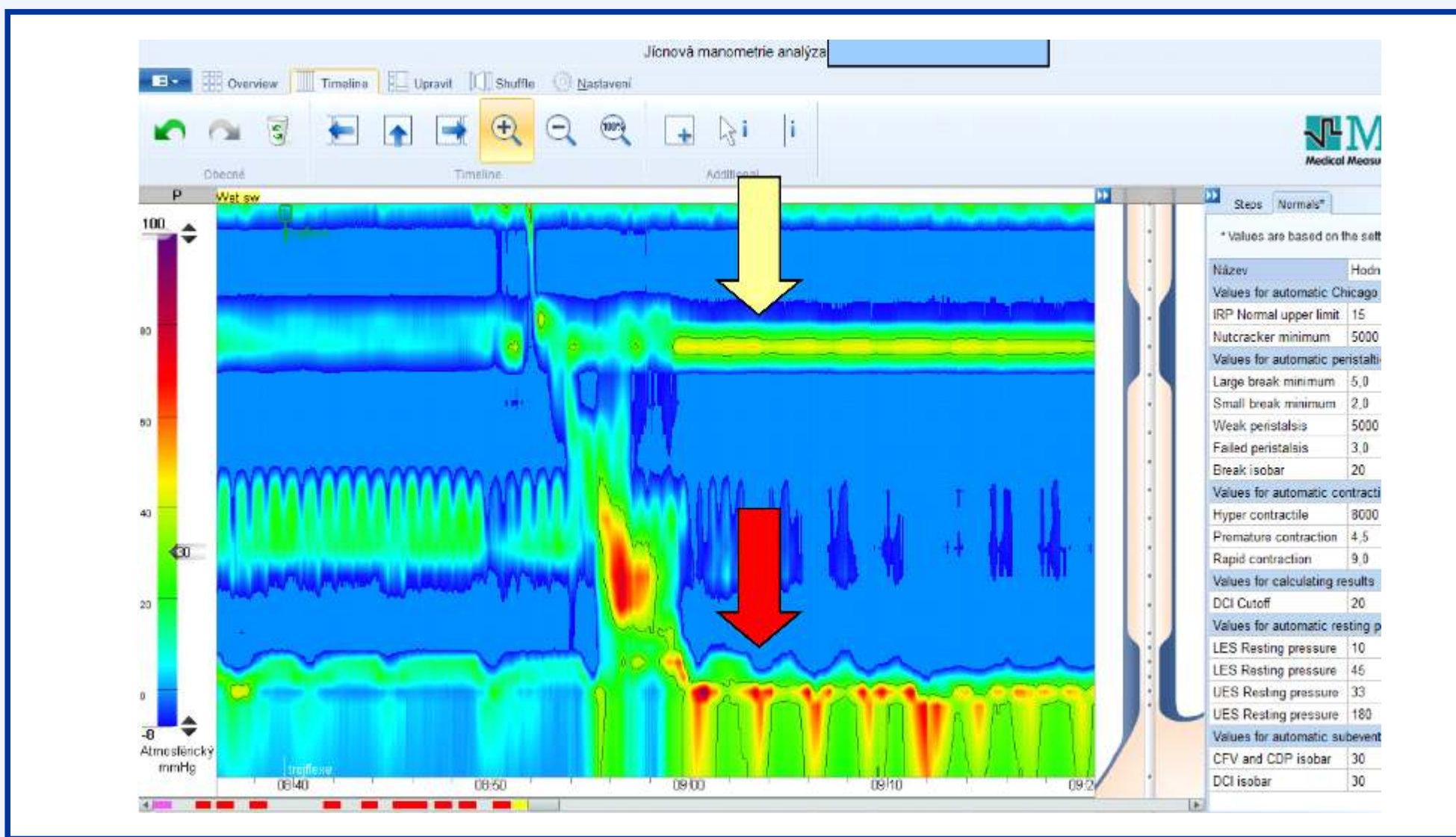
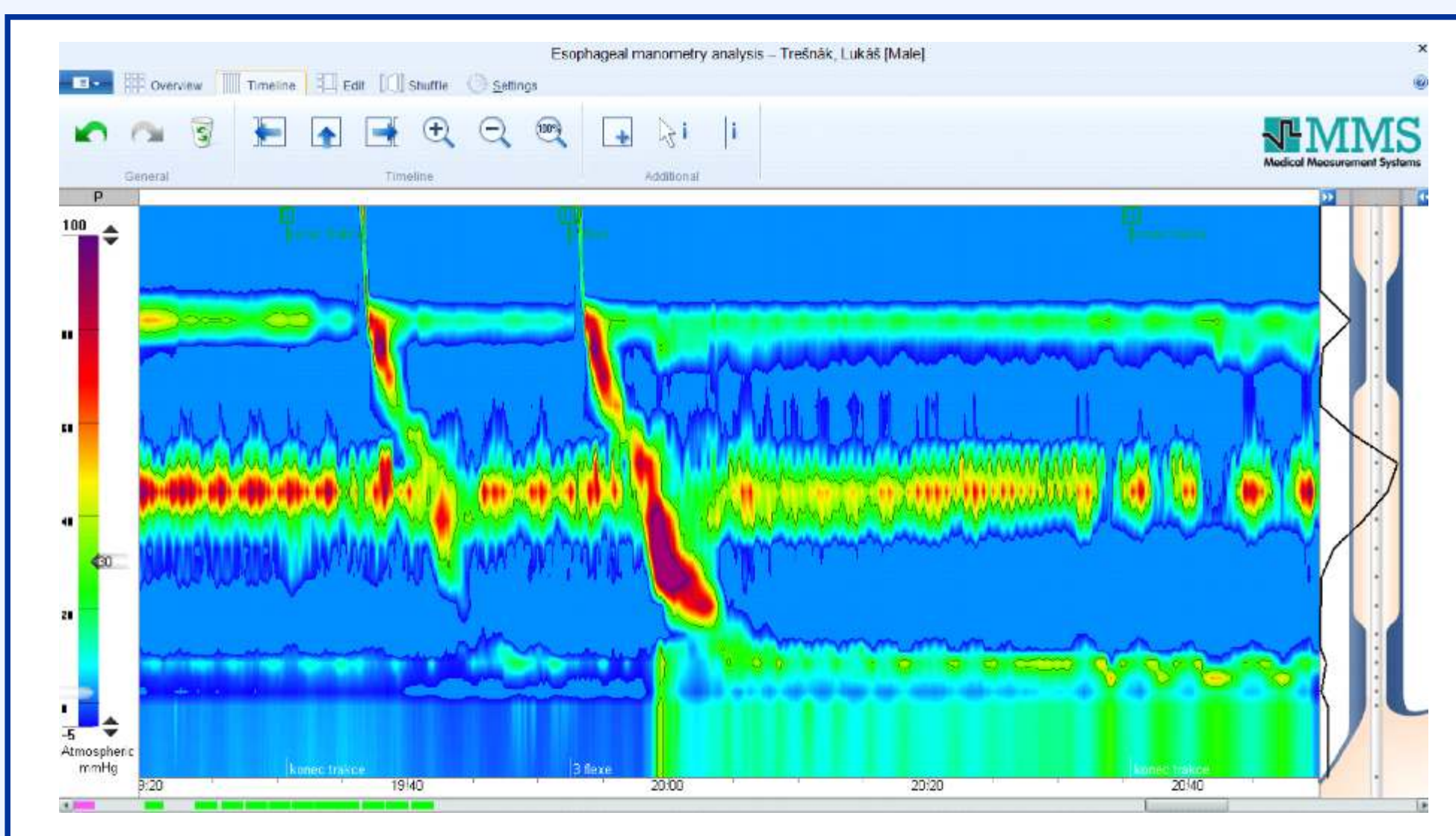


Fig. 4. Reactions of esophagus during triple flexion. Yellow arrow: shows the change in UES at the start of 3flexion Red arrow: shows the change in LES at the start of 3flexion.

Fig. 5. Reactions of esophagus during triple flexion. Red arrow: shows the change in LES at the start of 3flexion.



CONCLUSION : The results illustrate the influence of postural leg activities on intraesophageal pressure, confirming by means of HRM that diaphragmatic postural and sphincter function (crural part of the diaphragm) are interrelated. The similary reaction on postural activity is in the m. cricopharyngeus (UES).

This findings may serve as the basis for potential use of physiotherapy in the treatment of diseases of the esophagus such as globus pharyngeus and GERD. However, more clinical data are needed to support this hypothesis.

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