Ultrasound Pathology of Renal Dysfunctions and the Impact of Osteopathic Manual Therapy

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Philosophy of Osteopathy
A.T. Still (1897)
lack of knowledge about the kidney

- At what time was the man and woman born that knew and left on record a true and reliable knowledge of the renal capsule.
Agenda

- The relevance of kidneys in different medical systems
- Sonographic examples of normal and dysfunctional kidneys
- Pilotstudy: Ultrasound mobility of kidneys with Somatic Dysfunction (SD) before and after osteopathic manipulative treatment (OMT)
- Results
Kidney - Physiology

- The whole blood volume of the body circulates 300 times per day through the kidneys adding up to 1800 l, thus filtrating 170 l of primary urine.
- 20% of cardiac output is circulating through both kidneys.
In TCM we are confronted with the idea of Qi, which represents the essential energy which flows in the meridians.

The kidney has a dominant role within this system.

Direct Guidebook of Medicine

- “the lung is the governor of Qi and the kidney is the root of Qi”

Xinnong, Chinese Acupuncture and Moxibustion, p32-35:1990
The correlation of the kidney-meridian and the myofascial system
The Kidney – Fulcrum of the Central Myofascial Web?
Symptoms reported with Renal Somatic Dysfunction
N=31 Pts.

- Headaches (4)
- ENT (7)
- TMD (6)
- Cervicodorsalgia (8)
- SHP & Arms (7)
- Chest & Lung (4)
- Abdominal Syndrome/Digestion (9)

Symptoms reported with Renal Somatic Dysfunction N=31 Pts.

- Back- or Groin pain (12)
- Ischialgia (2)
- Knee (6)
- Ankle&Foot (6)
- Anogenital Syndrome (1)
- Recurrent Cystitis (3)
Internal & Neurological Findings

- Hypertension: 9 pts
- Thyroid Disorder: 8 pts
- Nephrology: 2 pts
  (kidney stones and renal insufficiency)
- Hypospermatogenesis: 1 pt
- Parkinson’s Disease: 1 pt
- Hx of Phlebothrombosis: 1 pt
- Primary Biliary Cirrhosis: 1 pt
- Chronic Hepatitis C: 1 pt
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The Kidneys - Fascias

- transversal fascia
- dorsal and ventral layer of renal fascia
- cranial adherence to diaphragm
- layers of renal fascia are filled with brown adipose tissue (capsula adiposa)
Perirenal Fat is organized as pericapsular appendices.
Normal Right Kidney
Right Kidneys Sonographic Mobility - Sagittal Plane

Normal Left Kidney with overlying Left Colonic Flexure
Adhesions frequently found in sites of the „renal junction lines“ (interrenuncuncular embryological seams)
Adhesion after OMT
Female pt., 67y, complaining of backpain.

History of renal cell carcinoma (left kidney, Resection 25y ago.

Consecutive Skoliosis

Adhesion after Tumor Resection
Kidney Stones with Hydronephrosis
Renal Contusion and Rupture
Contusion of Right Kidney
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Ultrasound Mobility of Kidneys with Somatic Dysfunction before and after OMT - a prospective and controlled Pilotstudy

• **Purpose:**

• To evaluate the influence of OMT on ultrasound mobility and ultrasound behavior of kidneys with osteopathic somatic dysfunctions
Ultrasound Mobility of Kidneys with Somatic Dysfunction before and after OMT - a prospective and controlled Pilotstudy

- **Design:** Prospective, controlled and non randomized study
- **Setting:** Private Office for Internal Medicine and Osteopathic Manipulative Medicine
Ultrasound Mobility of Kidneys with Somatic Dysfunction before and after OMT -
a prospective and controlled Pilotstudy

- **Participants:**
  - 31 consecutive patients with various complaints and fascial pull to one kidney on consultation,
  - 21 in Control Group (opposite kidney)
<table>
<thead>
<tr>
<th>Disorder</th>
<th>N Pts</th>
<th>Percent</th>
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<tbody>
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<td>angiomyolipoma &amp; cysts</td>
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<td>amyloidosis</td>
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<tr>
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<tr>
<td>ureterolithiasis</td>
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</table>
Methods (1)

- Ultrasonographic examinations were performed in 31 restricted kidneys and in 21 opposite kidneys serving as controls.
- Standard ultrasound access was used in supine or lateral succumbent position.
- Sites of restricted motion with respiration were registered.
- Clips were recorded within one cycle of a standardized respiratory maneuver.
- The excursions of the upper and lower poles were measured by postprocessing of the clips with the ultrasound machine’s calculation programs (ROM pre).
Methods (2)

- Standardized multitechnique OMT was applied to the restricted kidney.
- Reevaluation was performed with same access, body position and respiratory maneuver.
- Clips were recorded again.
- The excursions of the upper and lower poles were measured (ROM post).
- Statistical evaluation of data for intraobserver reproducibility, consistency and comparison of means was performed with SPSS® 18 (IBM®).
Intervention

- Multitechnique OMT applied to restricted kidney
  - Functional manipulation of the lumbus
  - HVLA/MET of the lower thoracic spine
  - MET of the renal fascia (stretch)
  - Visceral renal mobilisation
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Mobility & Restriction Site before OMT

Sonographic impairment of mobility

- No: Male - 1, Female - 1
- Yes: Male - 11, Female - 18

Restrictions of sonographic kidney mobility

- Site of restriction:
  - unclear: 2
  - P'osis: 3
  - AdhPsoas: 4
  - AdhSpPs: 3
  - AdhSp: 4
  - AdhLPs: 4
  - AdhLi: 11

No. of cases vs. Site of restriction
Viscoelasticity after OMT

![Graph showing viscoelastic behavior after OMT](image)
Result of OMT

No. of cases

unchanged    improved    worse

5            25            1

Cutoff values:
1. Viscoelasticity (improved or worsened) plus change of ROM > or < 0.49 cm
2. Viscoelasticity unchanged, but change of ROM > or < 0.99 cm
Results

Range of Motion: T-Tests

Bar chart showing the relative change of mobility with p < 0.001.

Box plots comparing pre and post measurements for control and OMT groups with p-values: p = 0.013, p = 0.42, p = 0.33, and p < 0.001.

Summary:
- Control group: Pre = 50, Post = 50
- OMT group: Pre = 50, Post = 50

Mean change between pre and post measurements.
Clinical Outcome

ROM post OMT

unchanged | improved | worse

unchanged: 9
improved: 19
worse: 2

14
Conclusions

- Ultrasound seems capable to depict SD of the kidneys as far as impairment of mobility and viscoelasticity is concerned
- OMT improved sonographic findings
- OMT significantly improved ROM in kidneys with SD
- OMT significantly improved ROM compared to the non-treated side
Conclusions

- OMT did not affect the ultrasound behavior of the non-treated kidney
- OMT of kidneys with SD improved clinical outcome
- The OMT protocol of the study should not be applied to very mobile kidneys
Bibliography

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Publications


Publications

