

Ultrasound Evidence of The Kidney Structural Changes from The Chemical Substances

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Keywords

Ultrasound diagnostics, Kidney, toxic substances, coffee, carbonated drinks, sugar, steroid

Summary

The article will present the ultrasound evidence of the changes in the kidney structure caused from the deferent chemical substances – coffee, caffeine containing teas, carbonated beverages, protein shakes, sugar, steroid, non-steroid anti-inflammation medication, antibiotic and marihuana. The deferent chemical substances effect the deferent parts of the kidney and create the deferent shapes of the pathologically changed tissue.

Methods and methodology

The object of the examination were the 385 males and women with the age from 13 to 87 years old. They were exposed to or internally took the chemical substances from the deferent period of time and in a deferent amount. The data are presented in the Table 1. For every one chemical substance were analyzed different numbers of patients: coffee - 107, carbonated beverages - 53, protein shakes - 29, sugar - 50, steroid medications - 82, non-steroid antiinflammation medication (Advil) - 29, antibiotic (Amoxicillin) - 24, marihuana - 14. The information for the amount and longevity of the taking chemical substances was collected from the patients and their medical history. The structural changes at the kidneys where examined with the Ultrasound diagnostic apparatus – LOGIQ P6.

Results

Every one toxic substances for the kidney chemical structure is forming the bolding line between the sinus and the medulla of the kidney. The localization of the bolding line is on the top of the pyramids and columnae renales. [Figure: 1] When the toxins

cannot be detoxicated are formed the spots with the different size and shape. The spots are the loose (hypoechogetic) or destroyed (hydronephrosis) structure of the kidney. It depends of the amount and time of the used toxin substance. The size of the spots can be the part of the kidney medulla and/or sinus. In some chronic cases can spread in the cortex of the kidney or can form the bridge through all parts of the kidney. The shape of the spots is different and depends of the toxin substance. Some of the toxins have the affinity to destroy the structure of the left or the right kidney, other affect both kidneys. The right kidney is more affected from the steroid and protein shakes. The left kidney is more affected from the coffee, caffeine containing teas and non-steroid anti-inflammation medication. The above kidneys are affected from the sweet, carbonated beverages and antibiotic (Table 1).

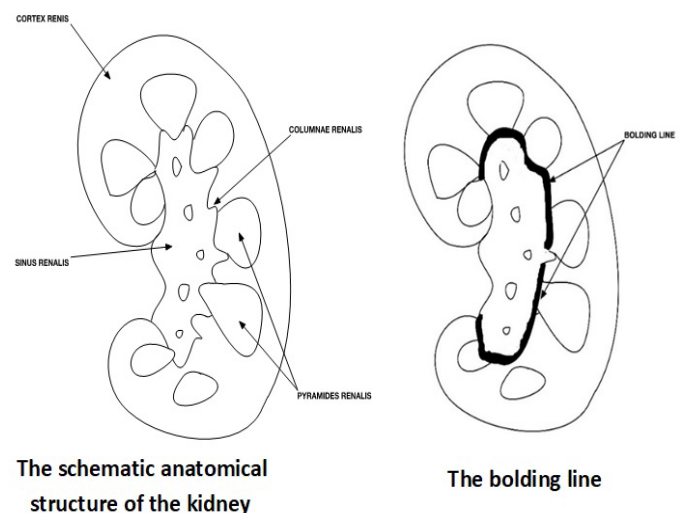


Figure 1: The schematic anatomic structure of the kidney and bolding line.

The structural kidney changes to the caffeine containing substance

The caffeine containing substances have the ability to destroy the structure of the left kidney. The loosening (hypoechoogenic) or destroying (hydronephrosis) structure is localized in the middle part of the kidney structure. Independently of the source of the coffee (American, European or Asian coffee) the effect is the same. The coffee affects the most of the upper part of the middle kidney structure, to the upper kidney pole. The caffeine containing tea (black, green, white tea and so on) has ability to affect the lower part of the middle kidney structure. The size of spot with the loose

or destroyed structure depends of the amount and time of the coffee or tea use. The shape is the triangular with the base to the cortex of the kidney and the top to the sinus of the kidney or can be ellipsoid. When the consumption of the caffeine containing beverages is for the very long period of time and big amount at the left kidney medulla is formed the hypoechoogenic bridge [Figure 12 and 13].

At the Figure 2 is presented the schematic spots formed from the coffee and caffeine containing tea. Figure: 3-13 are the US (ultrasound) pictures of the left kidney on the patients, which are used the deferent kind coffee and caffeine containing teas.

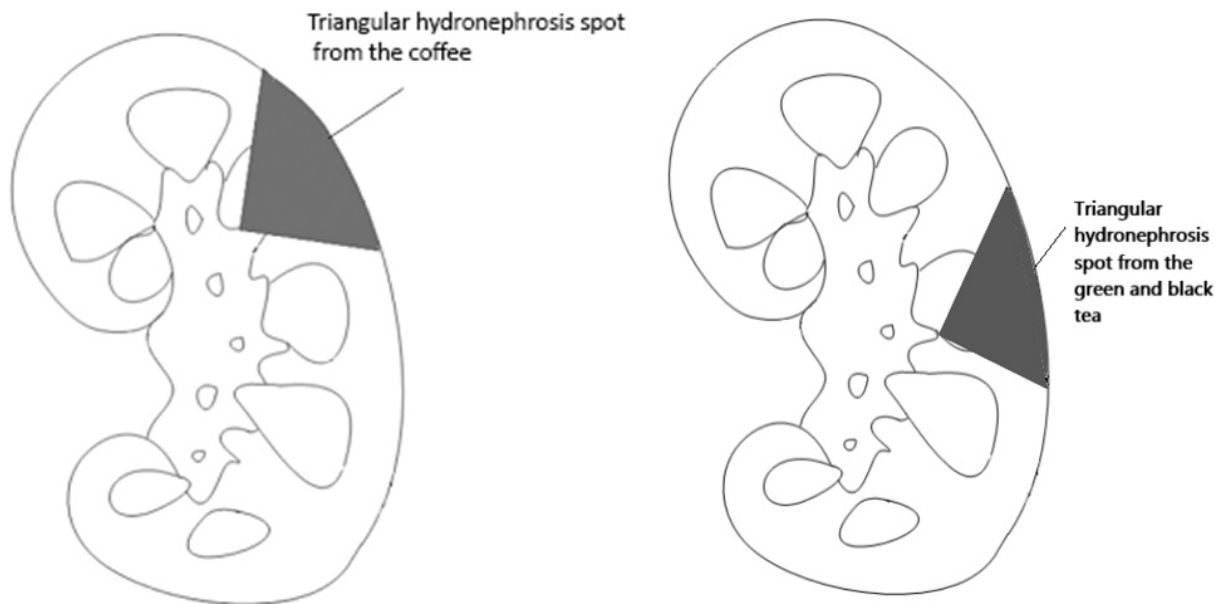


Figure 2: The schematic hypoechoogenic or hydronephrosis spot at the upper and middle part of the middle kidney medulla

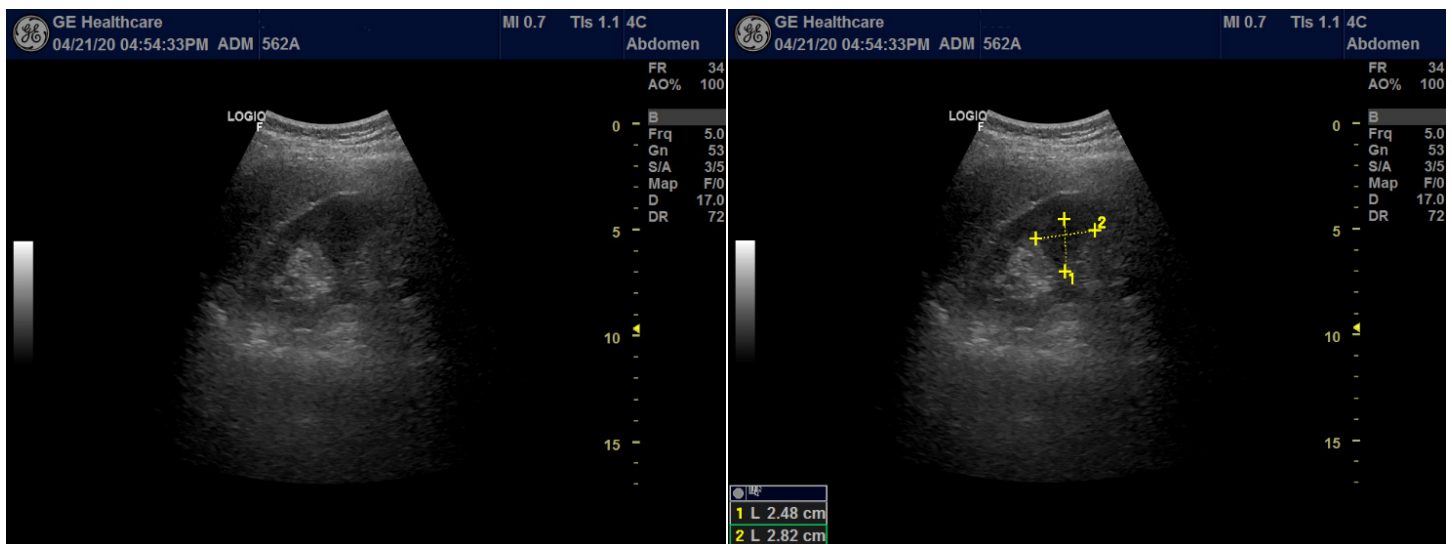


Figure 3: This is 45 years old female that has used 2 cups Columbian coffee daily in the last 7 years. At the left kidney is formed 2.8x2.4 cm triangular hypoechoogenic zone in the middle medulla.

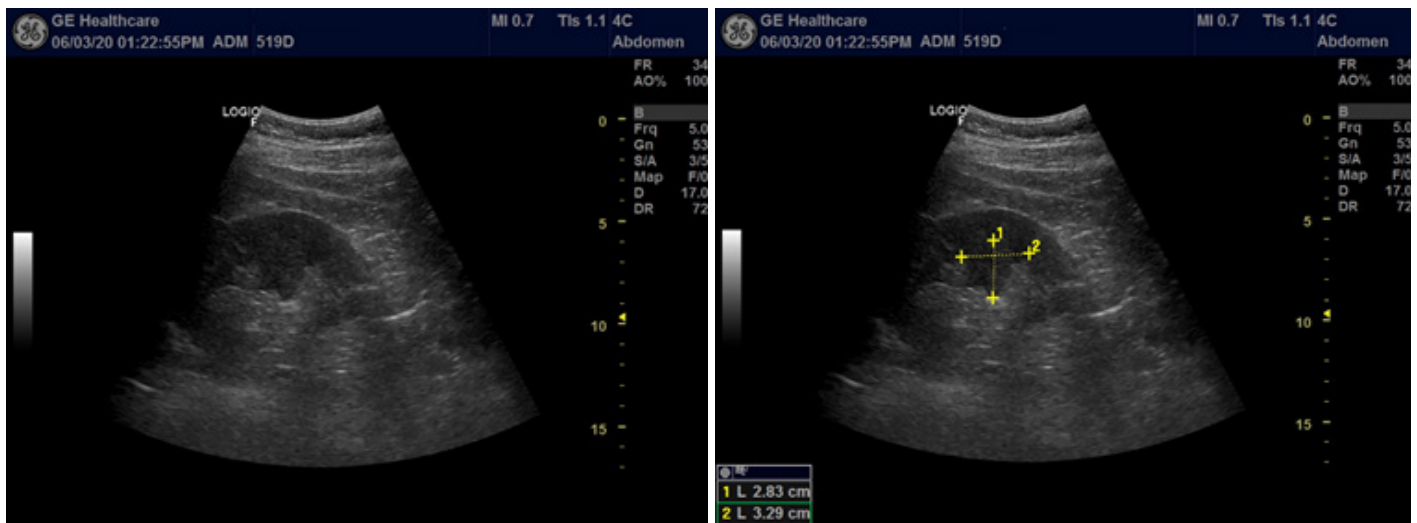


Figure 4: This is 38 years old male who has used 2-3 cups Starbucks coffee in the last 25 years, from last year is using 1 cup espresso coffee. The right kidney has the hypoechoic triangular spot at the middle medulla, 3.2x2.8 cm.

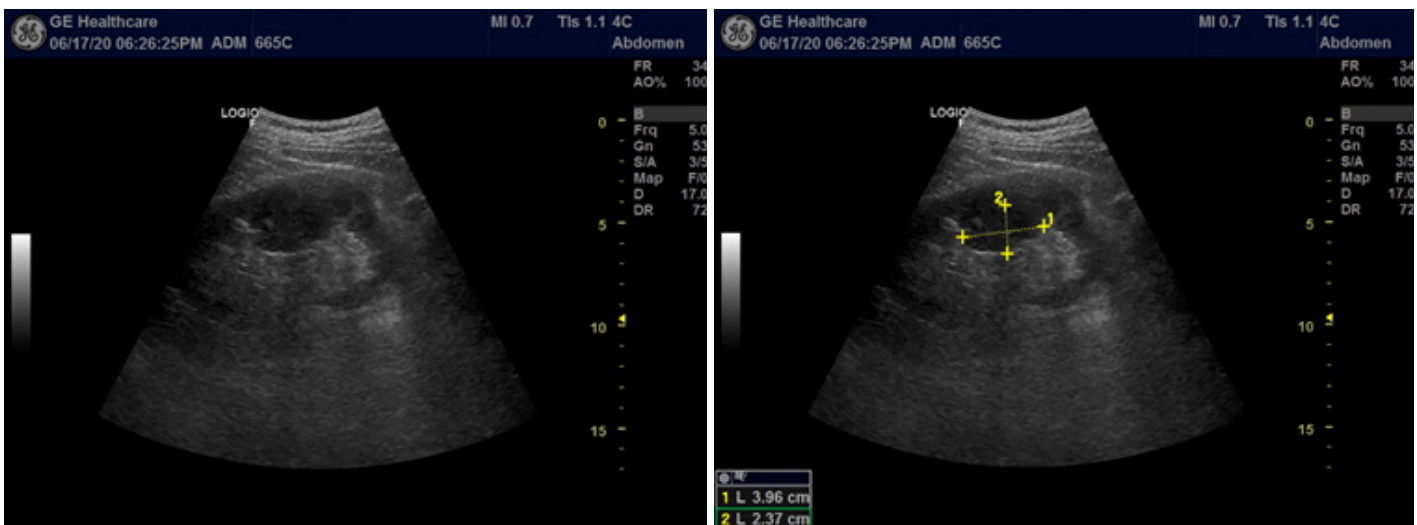


Figure 5: This is the 56 years old male who has used the espresso coffee in the last 12 years, 1 cup daily. The left kidney has the hydronephrosis spot at the middle medulla, 3.9x2.3 cm.

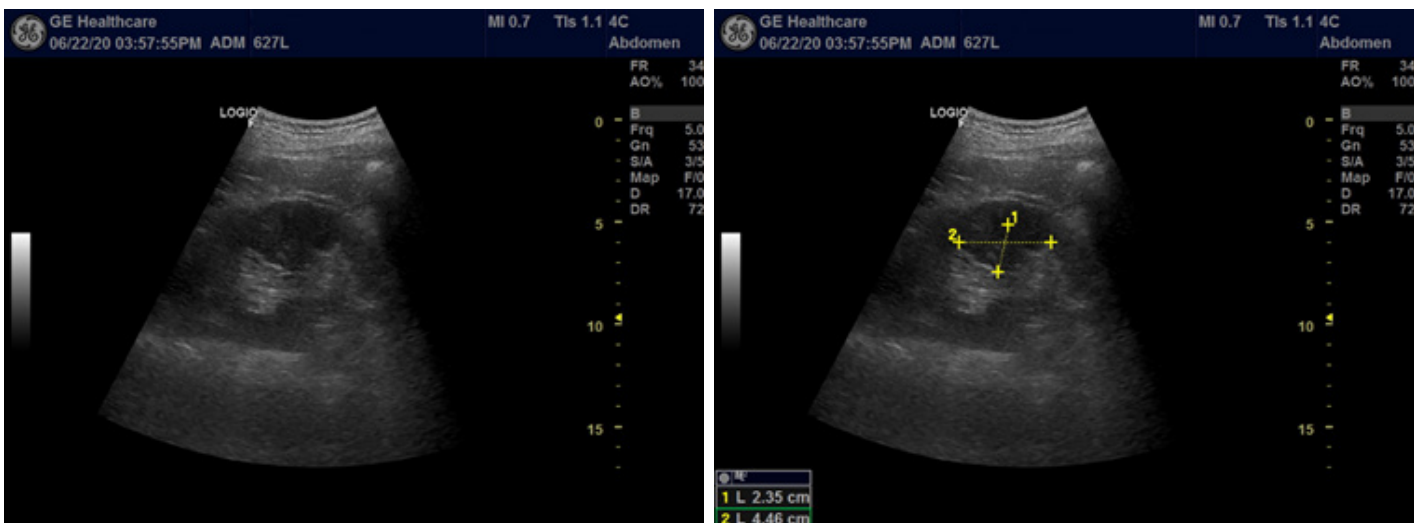


Figure 6: This is the 65 years old male who has used 1 cup Columbian coffee daily in the last 5 years. The left kidney has the hypoechoic to hydronephrosis spot at the middle medulla, 4.4x2.3 cm.

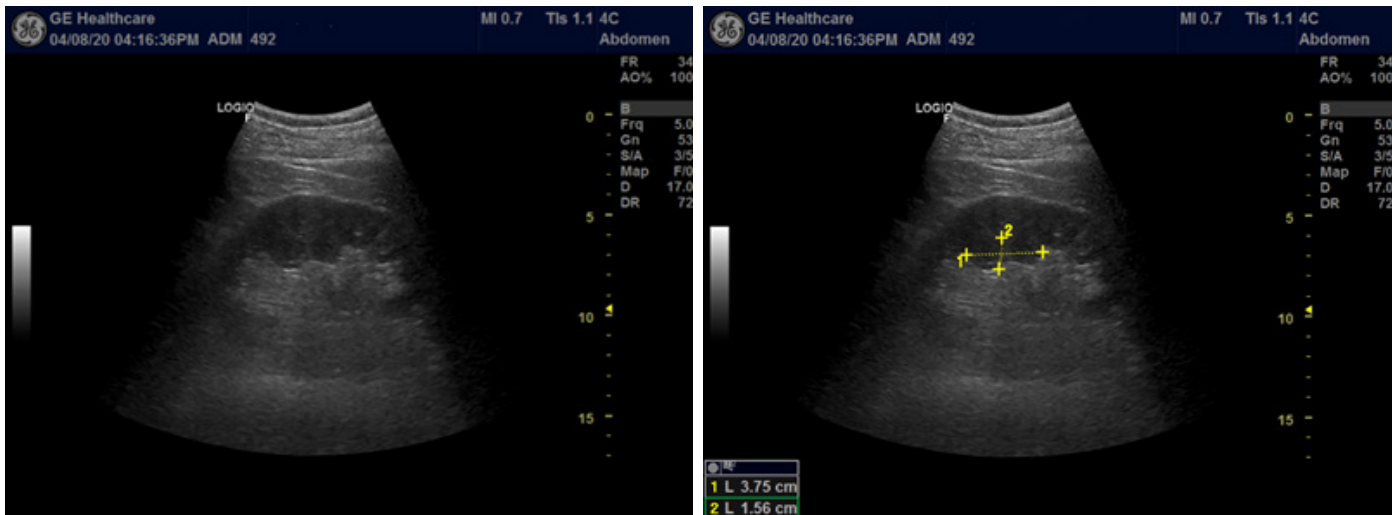


Figure 7: This is the 35 years old patient that has used 1-2 cups daily black coffee and black tea, in the last 5 years. The left kidney has 2 hypoechoic spots, for coffee and for tea, with the common dimension 3.7x1.5 cm.

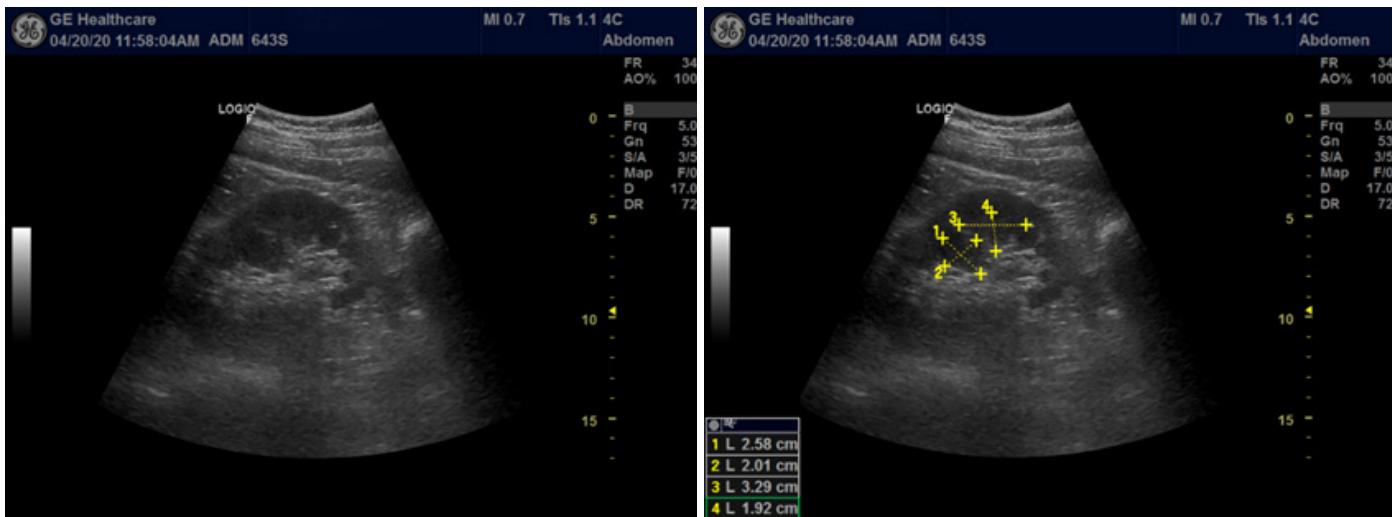


Figure 8: This is 40 years old male that has used 3-4 cups daily Columbian coffee and green tea in the last 10 years, from 2 years is using 2-3 cups daily. The left kidney has 2 x hypoechoic spots at the upper and lower part of the middle medulla, 2.5x2.1 cm (coffee) and 3.2x1.9 cm (green tea).

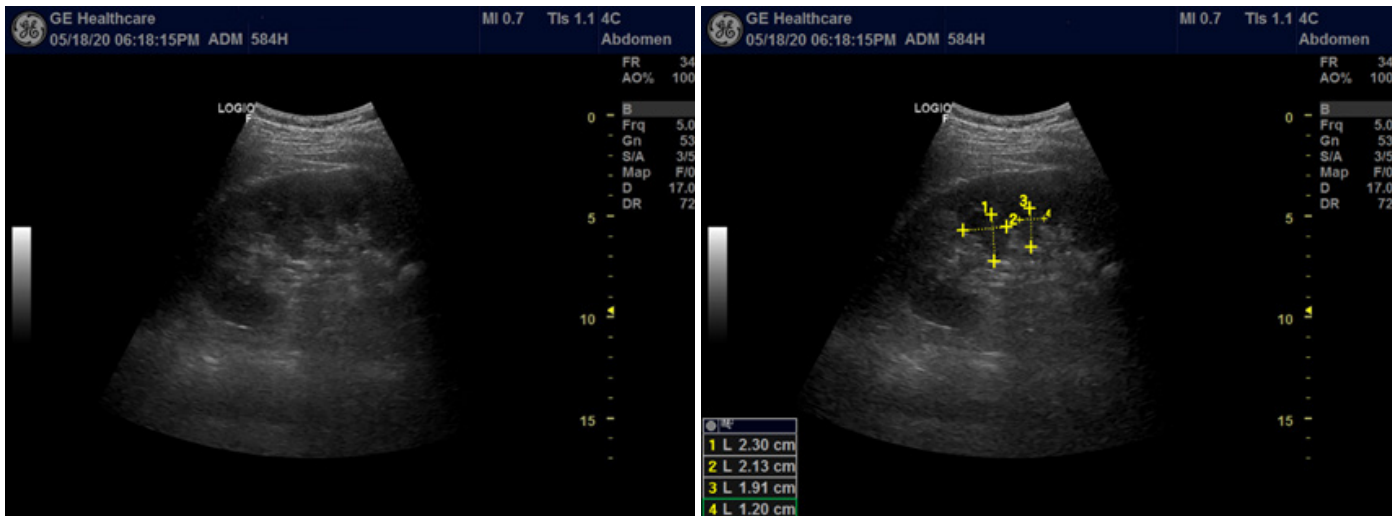


Figure 9: This is 34 years old male who has used 2 cups expresso coffee and 1 cup green tea daily in the last 10 years. At the medial medulla of the left kidney are formed 2 hypoechoic triangular spots, 2.3x2.1 cm (coffee) and 1.9x1.2 (green tea).

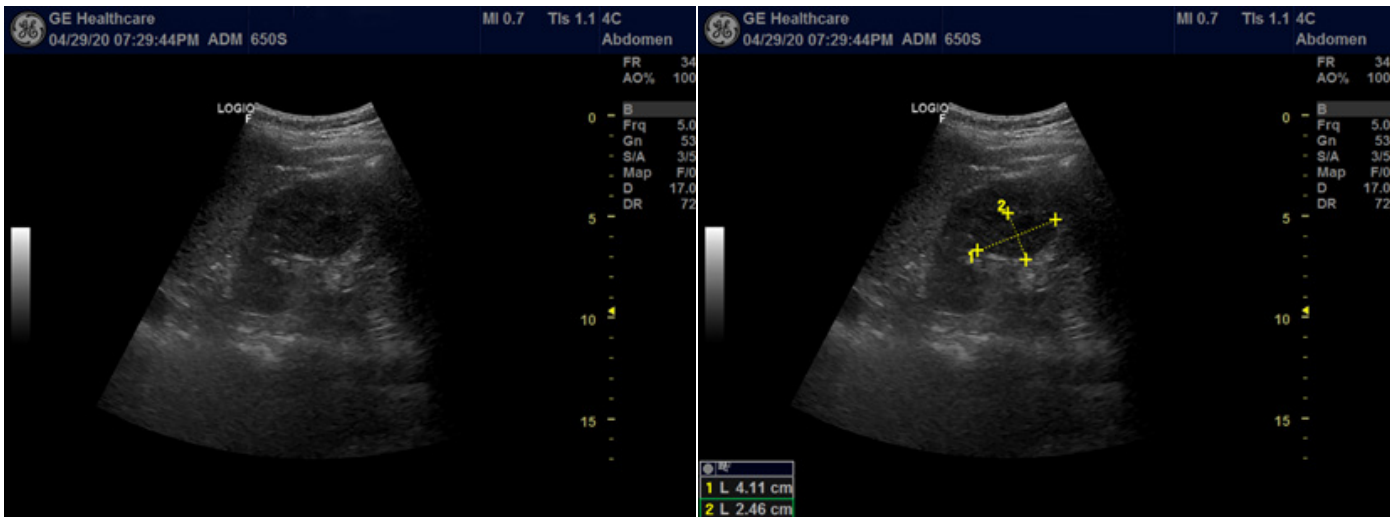


Figure 10: This is the 37 years female who consumed the green tea, 1 cup daily, in the last 20 years. The right kidney has the hydronephrosis spot which extended in the hypoechoic zone at the middle medulla, 4.1x2.4 cm.

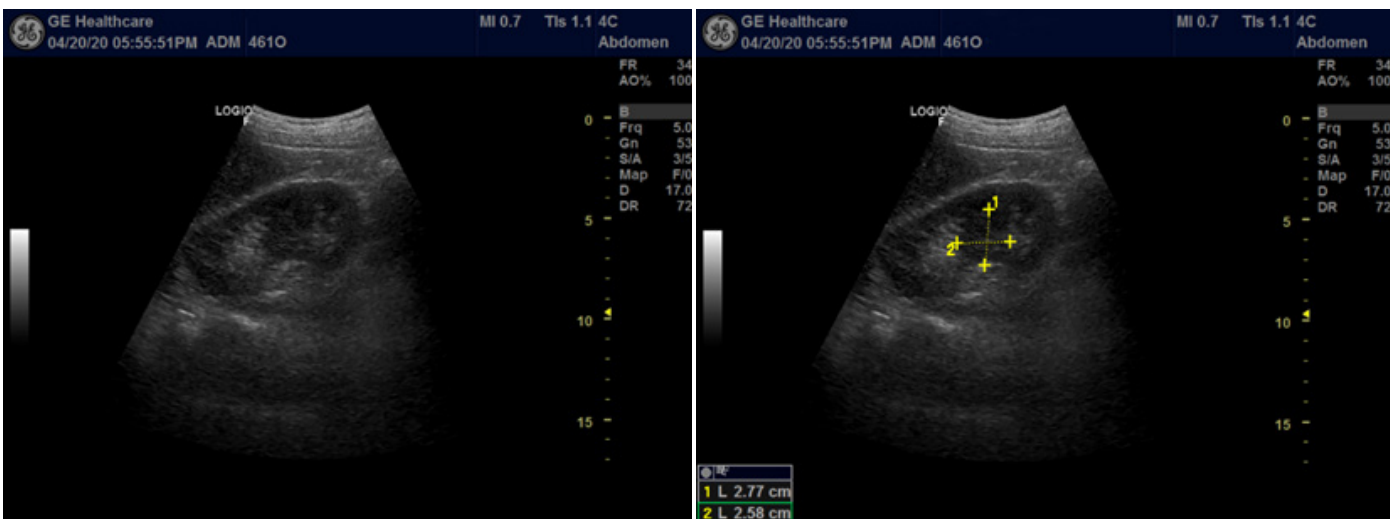


Figure 11: 42 years old male after 7 years caffeine enema – 2.7x2.5 cm hypoechoic to hydronephrotic spot at the middle medulla of the left kidney.

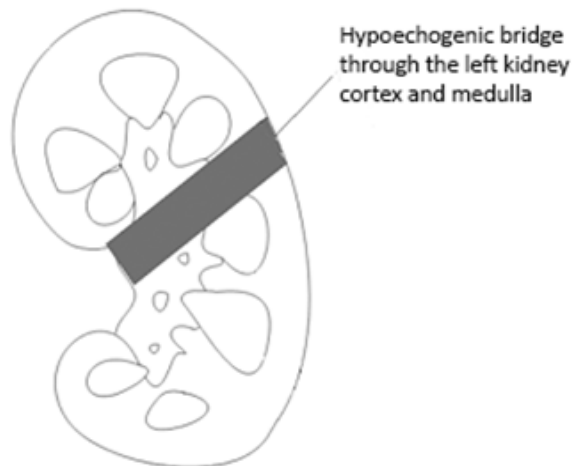


Figure 12: The schematic hypoechoic bridge through the kidney cortex and medulla in the patient that has used the long period of the time and big amount of the coffee.

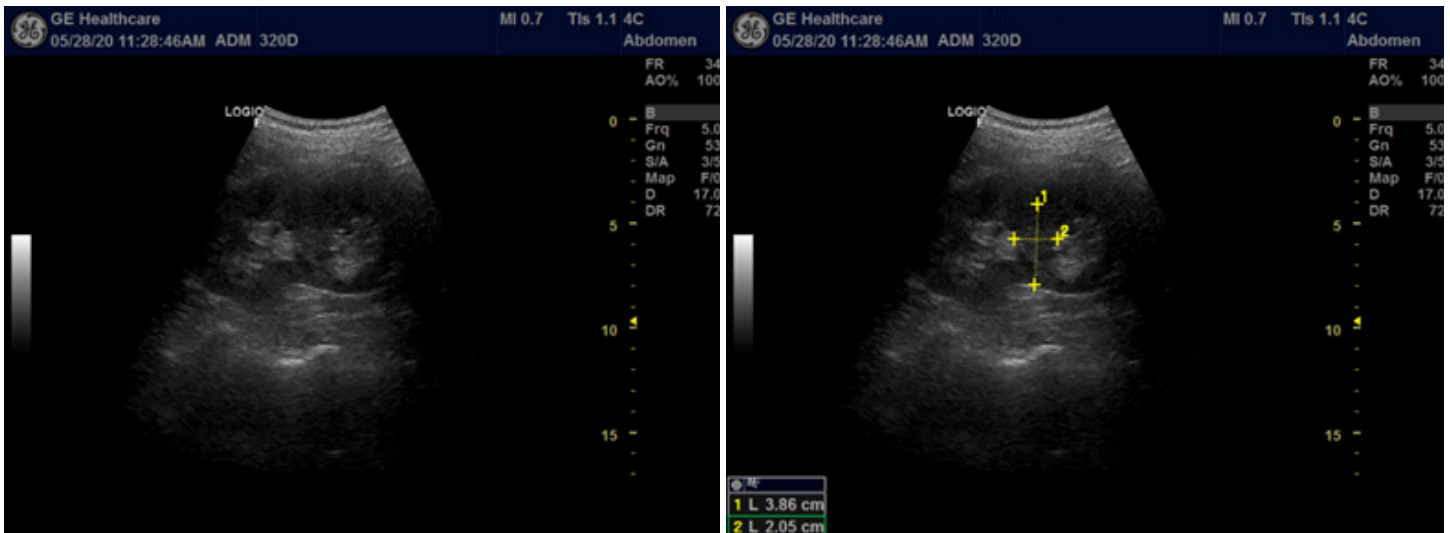


Figure 13: This is the 49 years old male that has used 25 years espresso and Turkish coffee in the last 25 years. The left kidney has the 3.8x2.0 cm hypoechoic bridge.

Analysis of the data

For the purpose of the article were analyzed 107 patients, 56 women, from 13 to 71 years old, 51 men, from 20 to 75 years old. [see Table 1] All of the patients which used the coffee or caffeine containing tea are formed the loose (hypoechoic) or destroyed (hydronephrosis) structure spot at the middle part of the left kidney ($p < 0.3$).

1) Using of the coffee or caffeine containing tea from 1 to 7 cups daily (1 cup - 20 oz), from 1 to 35 years period, at the females create a hypoechoic to hydronephrosis spot at the medulla of the left kidney, with the dimensions: max. 4.1x 2.2 cm and min. 1.6x1.4 cm for coffee; max. 2.4x1.8 cm and min. 1.3x1.2 cm for caffeine containing tea ($p < 0.3$).

2) Using of the coffee or caffeine containing tea from 1 to 4 cups daily (1 cup - 20 oz), from 2 to 50 years period, at the males create

a hypoechoic to hydronephrosis spot at the medulla of the left kidney, with the dimensions: max. 4.6x 2.2 cm and min. 1.7x1.5 cm for coffee; max. 3.4x1.5 cm and min. 1.9x1.2 cm for caffeine containing tea ($p < 0.3$).

The kidney structural changes to the carbonate drinks

The carbonate drinks (mineral carbonated water, soda, cola, red bull, sprite) have ability to change the structure of the both kidneys. At the medullar part of the kidneys are formed the lines through the kidney length [Figure 14]. The line's length and thickness dependent from the amount and time of the taken carbonated drinks.

At Figure 14 is presented the schematic lines formed from the carbonated drinks. Figure 15-19 are the US pictures of the kidneys of the patients, which are used the carbonated drinks.

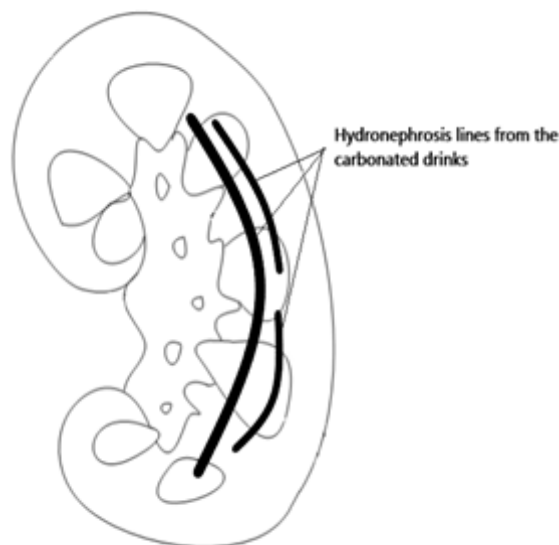


Figure 14: The schematic hydronephrosis lines in the length of the kidney medulla from the carbonated drinks.

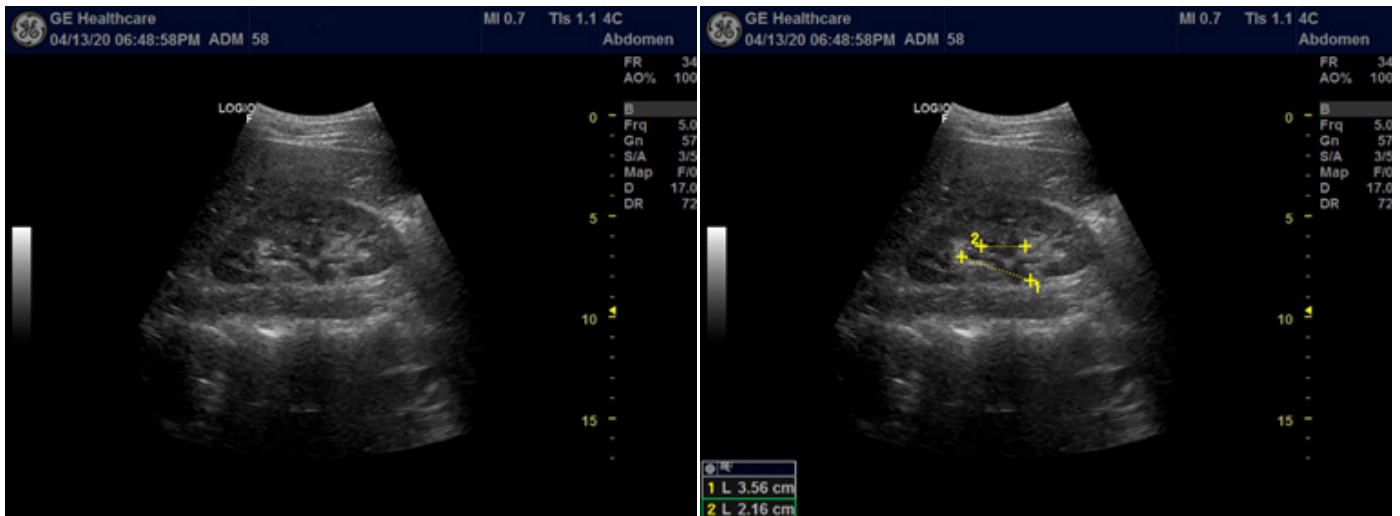


Figure 15: The right kidney: 38 years old female has used 1 cup daily carbonated mineral water in the last 4 years – hydronephrotic lines – 3.5 and 2.1 cm long.

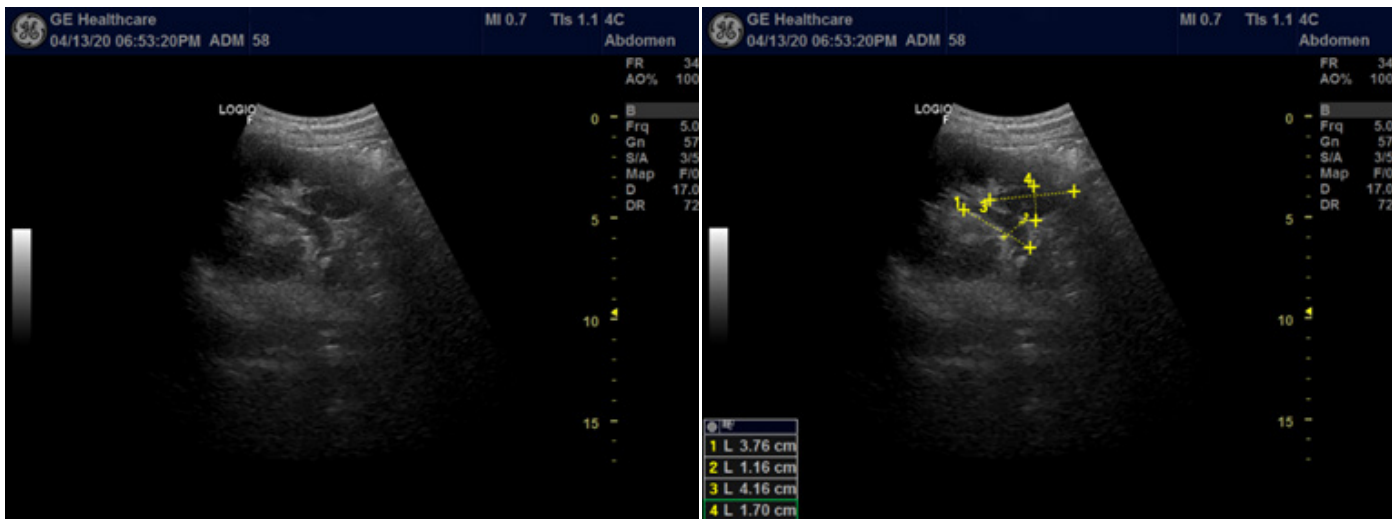


Figure 16: The left kidney: 38 years old female has used 1 cup daily carbonated mineral water in the last 4 years – hydronephrotic lines – 3.7x1.1 cm and 4.1x1.7 cm.

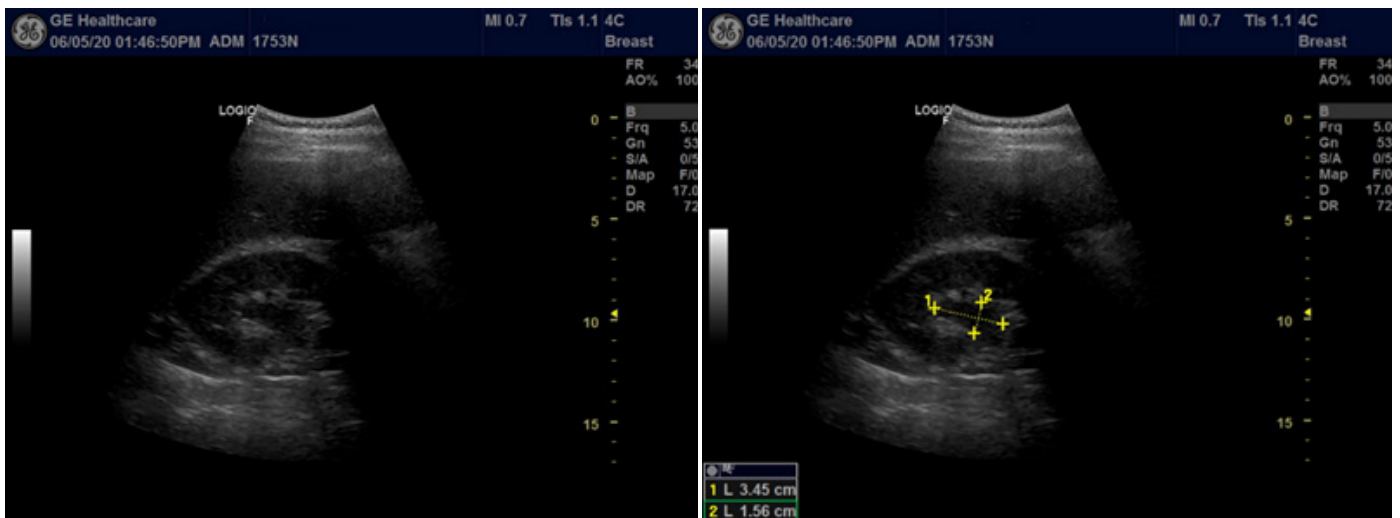


Figure 17. a. Right kidney: The right and left kidney changes -a. b. 42 years old male has consummated 1 liter daily carbonated drinks – soda, coca cola, red bull, and beer. The right kidney has the hydronephrosis thick line 3.4x1.5 cm.

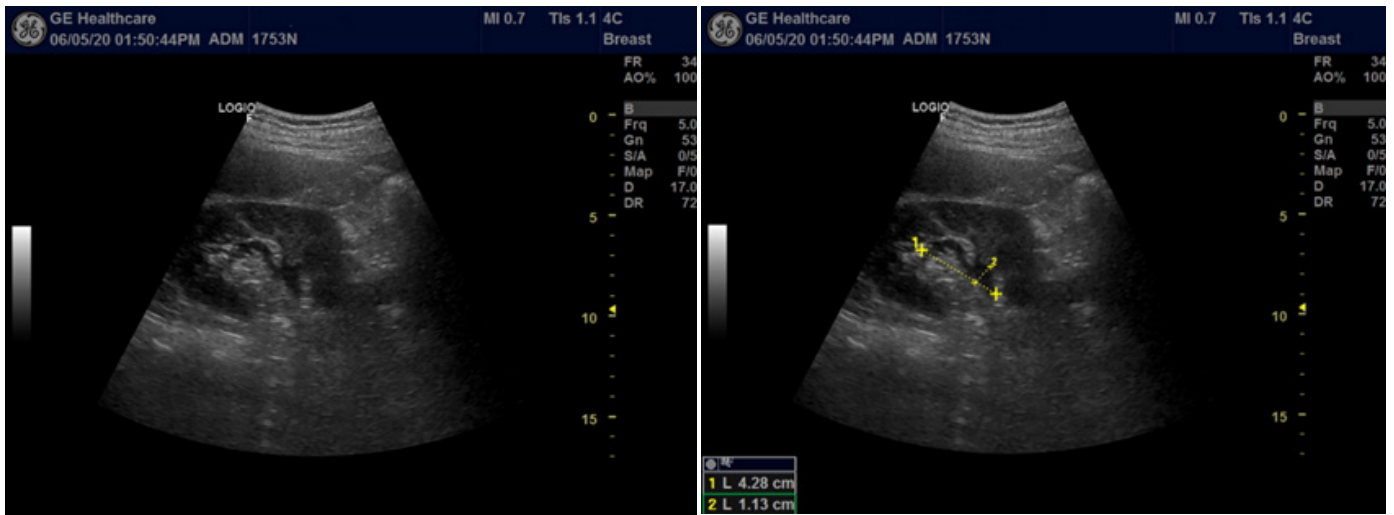


Figure 17. b Left kidney: The right and left kidney changes – a. b. 42 years old male has consumed 1 liter daily carbonated drinks – soda, coca cola, red bull, beer. The left kidney has the hydronephrosis curved line 4.2x1.1 cm.

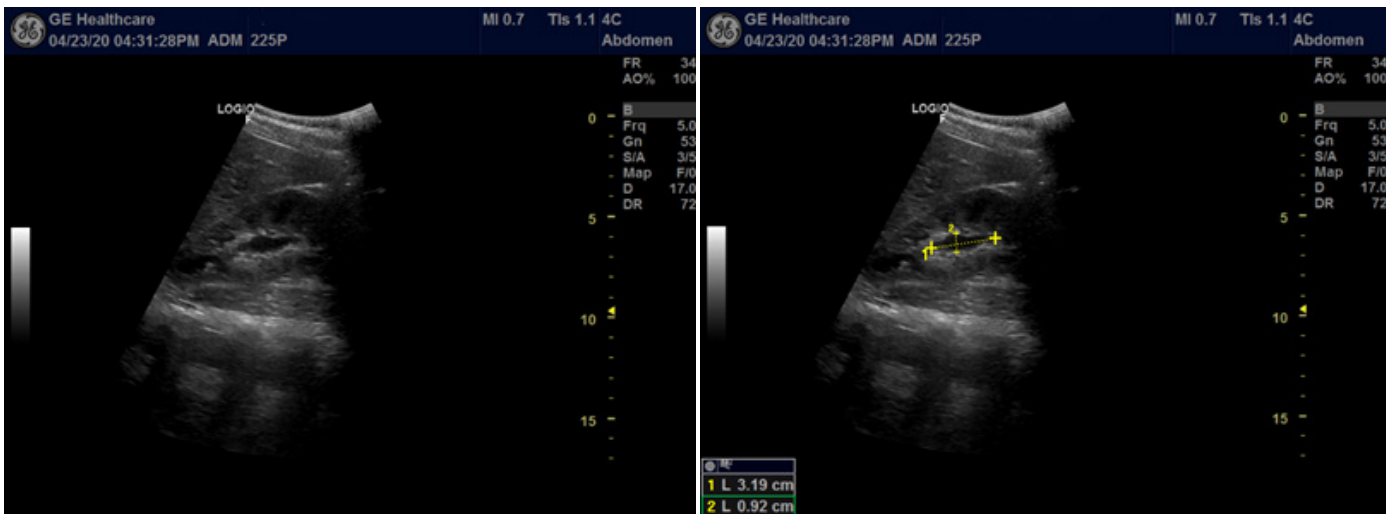


Figure 18: This is 23 years old female that has used in the last 4 years 1 bottle daily the carbonated drinks – coca cola, sprite. The right kidney has 3.1x0.9 cm hydronephrosis line.

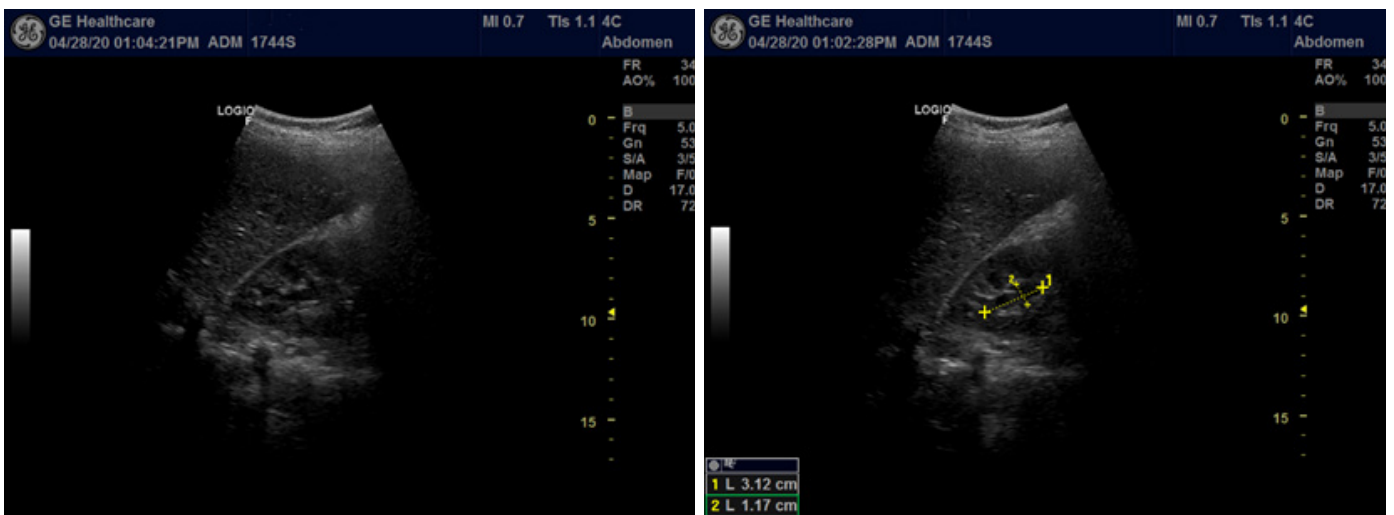


Figure 19. a. Right kidney

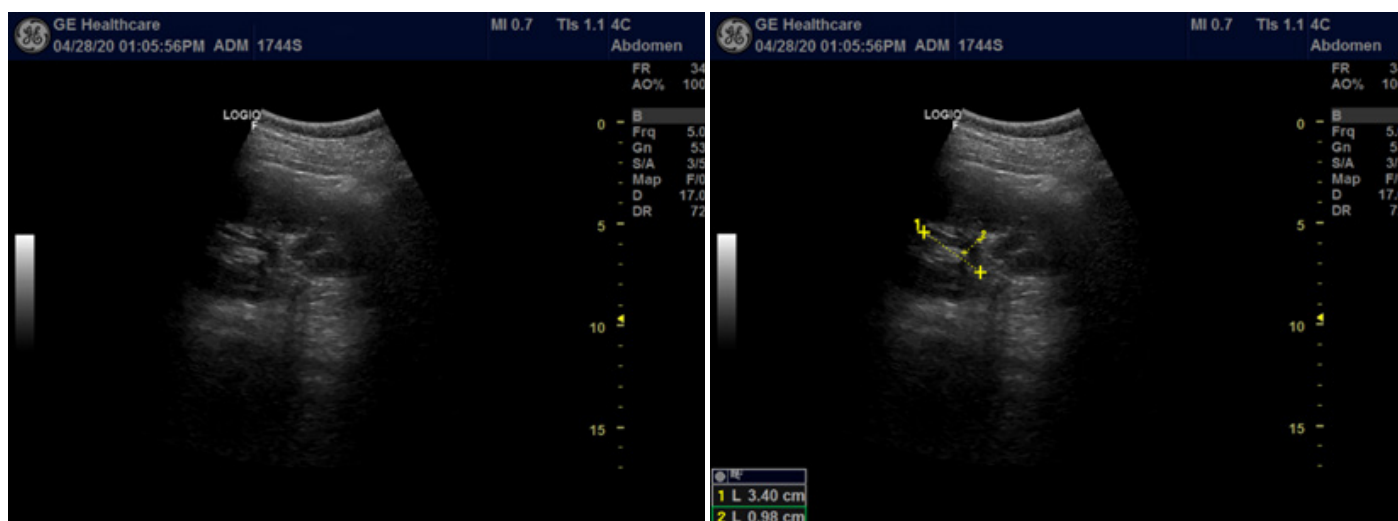


Figure 19. b. Left kidney

Figure 19. a, b: This is the 27 years old female that has used 10 years 1 cup daily mineral carbonated water. The right and left kidney have the hydronephrosis lines. The right kidney is with the dimension 3.1x 1.1 cm and the left kidney – b. 3.4x0.9 cm

Analysis of the data

The 53 patients which have used the different kind carbonated beverages were analyzed. The 27 males, from 18 to 69 years old and 26 females, from 13 to 61 years old. Independent of the kind of the carbonated drink every one patient, has the lines of the loose (hypoechogetic) or destroyed (hydronephrosis) structure of the right and/or left kidneys ($p<0.3$). The length and thickness of the lines depends of the amount and time of the used carbonated drinks.

1) Using of the carbonated beverages from 1 to 2 cups daily (1 cup - 20 oz), from 2 months to 20 years period, at the females create a hypoechogetic to hydronephrosis lines at the medulla of the right and/or left kidney, with the dimensions: max. 5.5x 0.9 cm and min. 1.4x0.7 cm for the right kidney; max.4.1x1.5 cm and min. 1.8x0.5 cm for the left kidney ($p<0.3$).

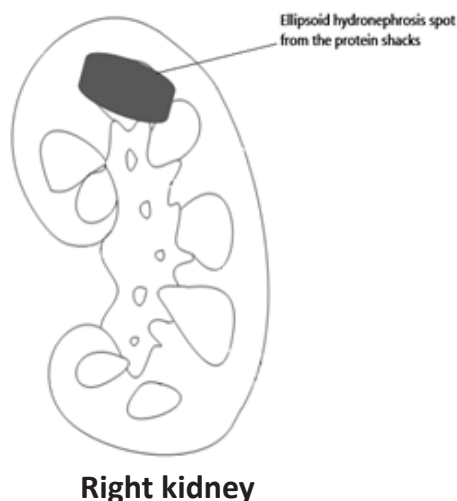
2) Using of the carbonated beverages from 1 to 8 cups daily (1

cup - 20 oz), from 3 days to 30 years period, at the males create a hypoechogetic to hydronephrosis lines at the medulla of the right and/or left kidney, with the dimensions: max. 4.9x 0.9 cm and min. 1.5x1.0 cm for the right kidney; max.4.4x2.3 cm and min. 1.9x0.7 cm for the left kidney ($p<0.3$).

The structural kidney changes to the protein shakes

When the protein shakes are used, they have ability to change the structure of the upper pole or upper middle part of the right kidney ($p<0.3$). The formed spot of the loose (hypoechogetic) or destroyed (hydronephrosis) tissue of the medulla has the ellipsoid or triangular shape. The size is variated with the amount and time of the taken protein shakes.

At the Figure: 20 is presented the schematic ellipsoid spot formed from the protein shakes. Figure 21-26 are the US pictures of the right kidney on the patients, which are used the protein shakes.



Right kidney

Figure 20: The ellipsoid hydronephrosis spot in the upper part of the right kidney, from the protein shakes.

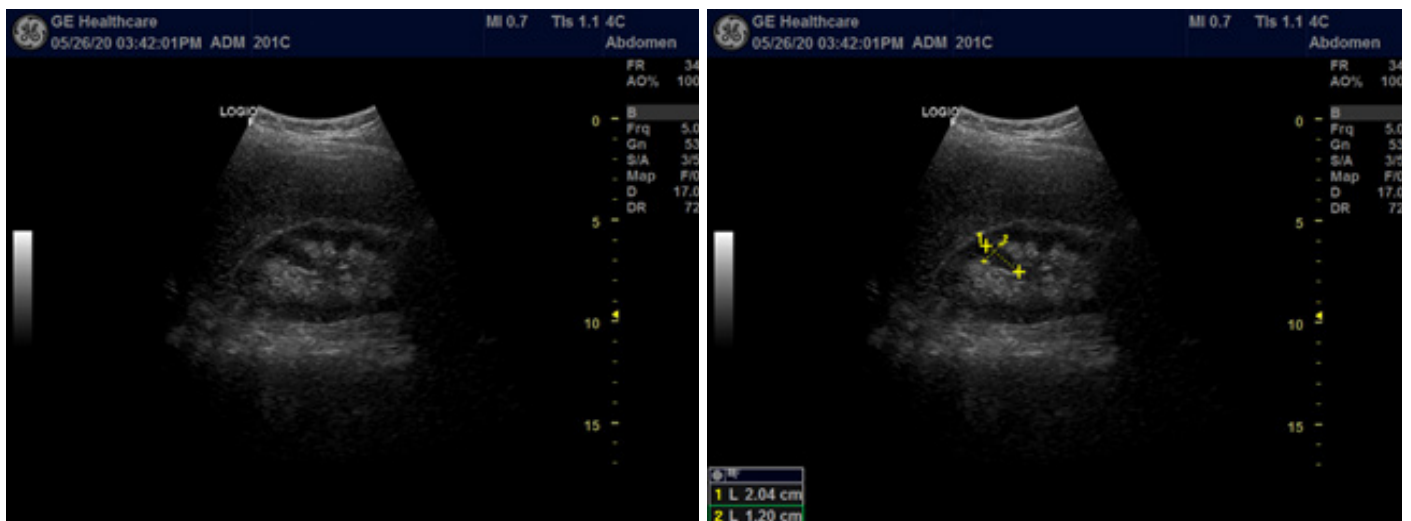


Figure 21: This is the 47 years old female that has used the protein shakes for 2 months, before her two pregnancies. The right kidney has the 2.0x1.2 cm ellipsoid hypoechoic spot at the upper part.

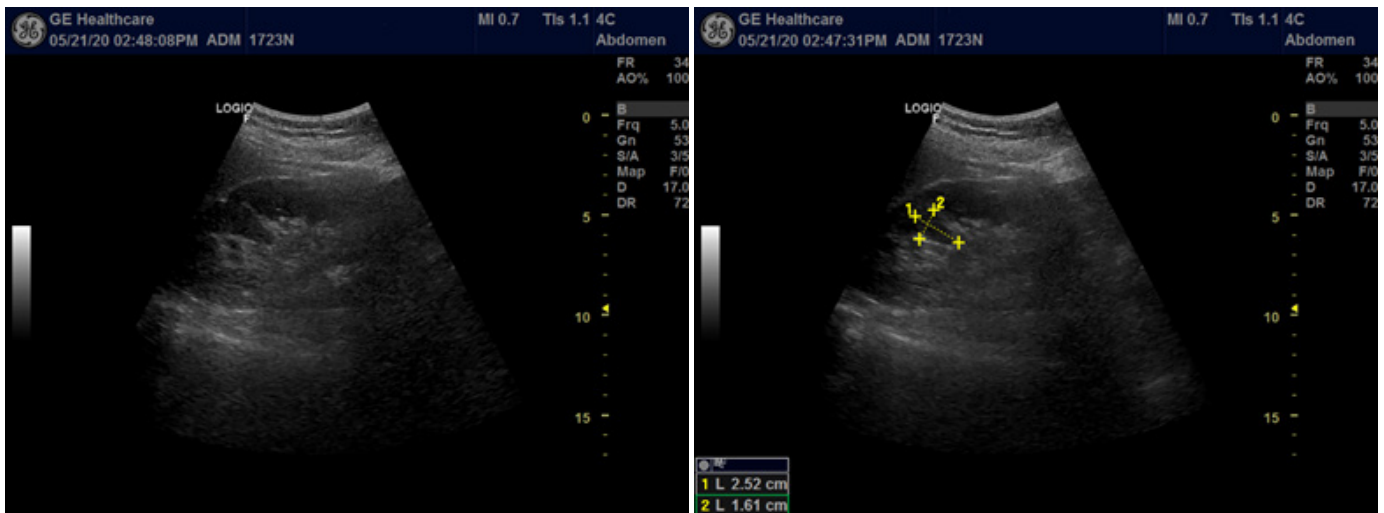


Figure 22: This is the 42 years old female after using 2 months the protein shakes for the loss of the weight. The right kidney has 2.5x1.6 cm triangular hypoechoic zone at the upper part.

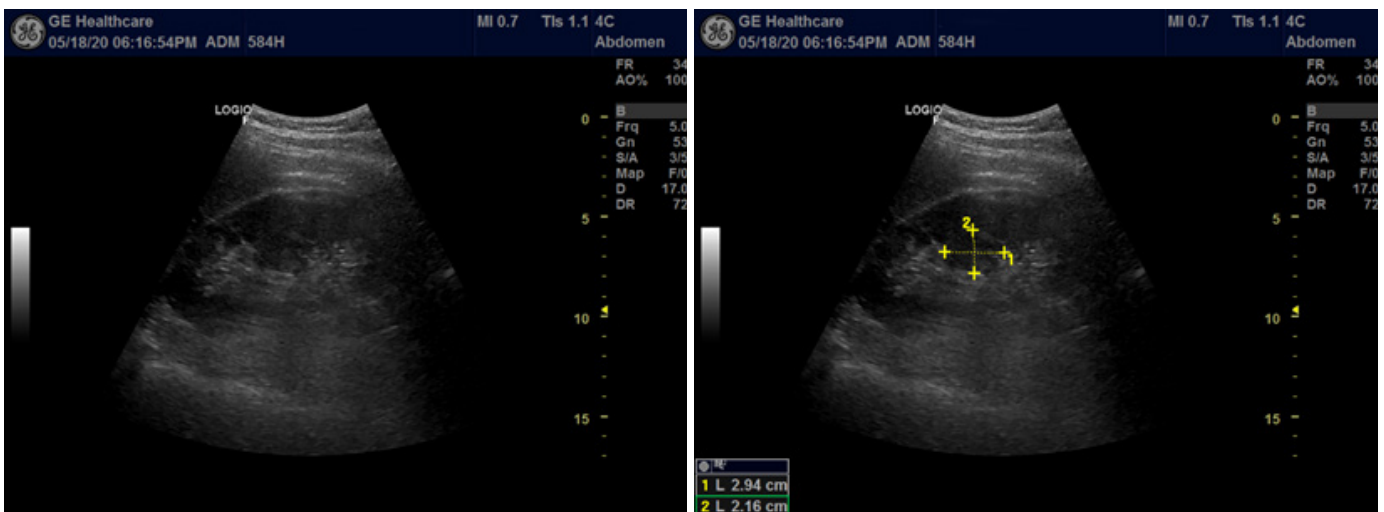


Figure 23: This is the 34 years old male with the 2.9x2.1 cm ellipsoid hypoechoic spot in the upper part of the middle medulla of the right kidney, after using 3 months of the protein shakes, for the muscle building.

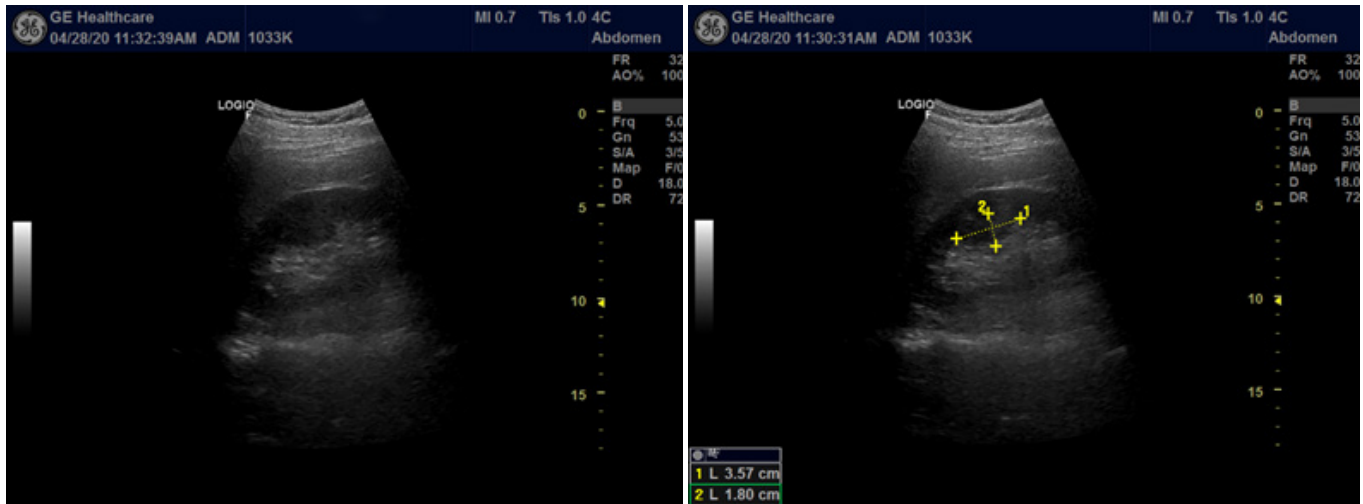


Figure 24: This is the 50 years old male after has used 30 years the protein shakes. The right kidney has the ellipsoid hypoechoic zone at the upper part of the middle medulla, 3.5x1.8 cm.

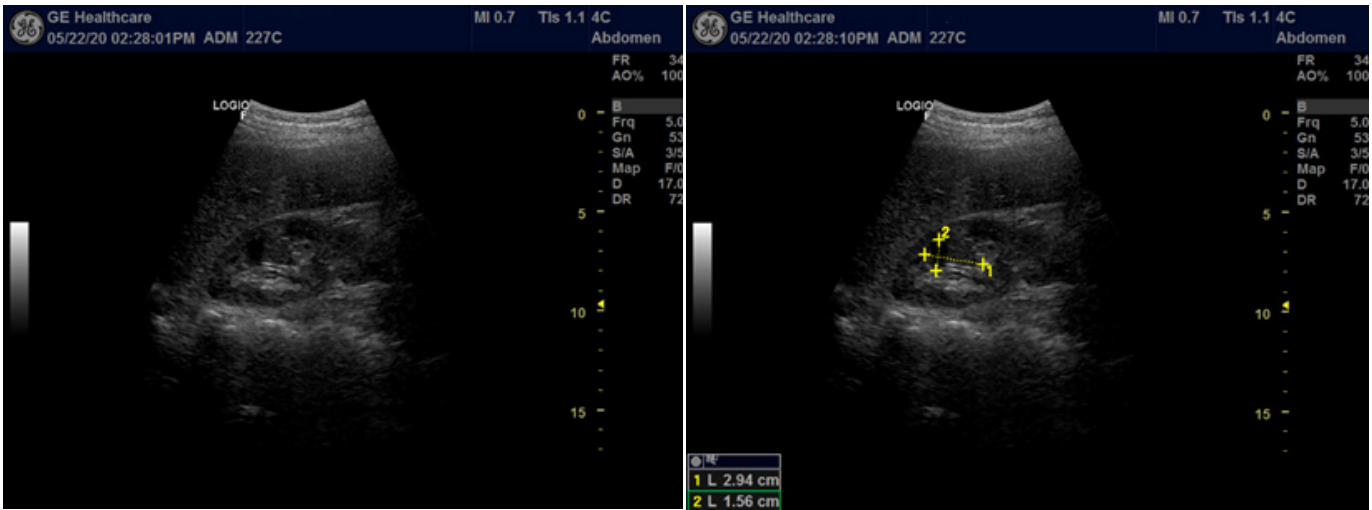


Figure 25: The 31 years old male after using periodically protein shakes, for energy. The right kidney 3.1x1.5 hypoechoic and hydronephrotic spot in the upper part of the middle medulla.

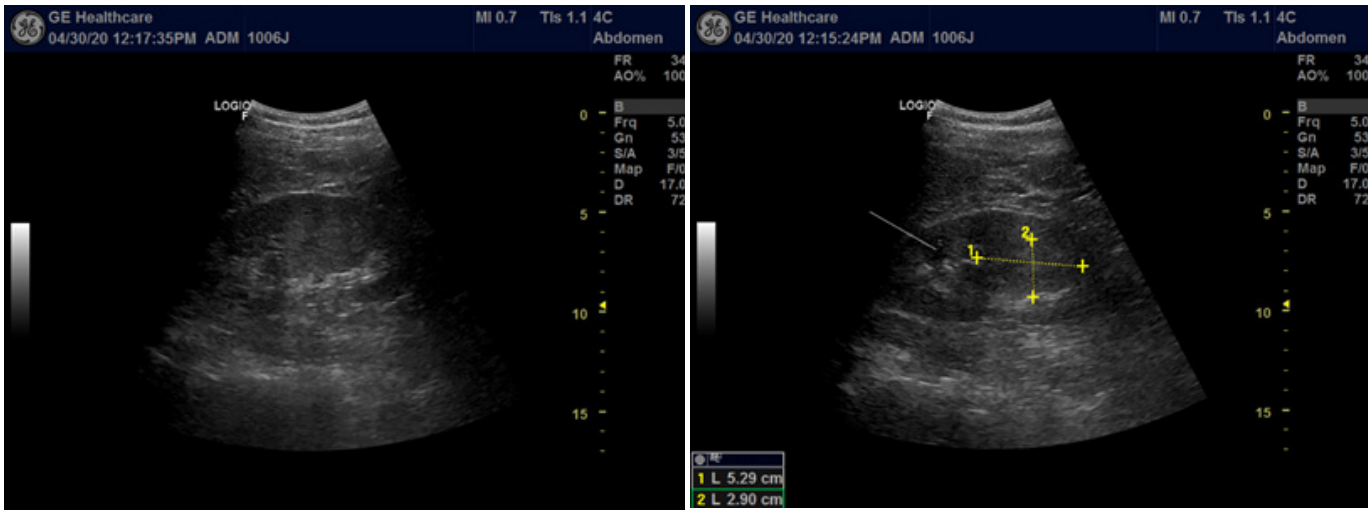


Figure 26: This is the 40 years male has used 26 years protein shakes, stopped to use in the last 5 years. The right kidney has the hypoechoic zone (white line) at the upper medullar part and 5.2x2.9 cm big hyperechoic zone at the middle medullar part. After he stopped using the protein shakes, the affected tissue has had replaced with the hyperechoic one.

Analysis of the data

The 29 patients, 14 females, from 21 to 70 years old and 15 males, from 20 to 51 years old were analyzed. All patients which used the protein shakes, independently of the kind, are formed the loose (hypoechoogenic) or destroyed (hydronephrosis) structure spot, with the ellipsoid or triangular shape, at the upper part of the right kidney ($p < 0.4$).

1) Using of the protein shakes 1 cup daily (1 cup - 40 oz), from 1 month to 5 years period, at the females create a hypoechoogenic to hydronephrosis spot at the upper part of the right kidney medulla, with the dimensions: max. 4.2x 1.9 cm and min. 1.7x1.5 cm ($p < 0.4$).

2) Using of the protein shakes 1 cup daily (1 cup - 40 oz), from 1 month to 30 years period, at the males create a hypoechoogenic to

hydronephrosis spot at the upper part of the right kidney medulla, with the dimensions: max. 5.2x 2.9 cm and min. 1.7x1.4 cm ($p < 0.4$).

The structural kidney changes to the steroids

The steroid medications are able to destroy the kidney structure, mainly of the right kidney ($p < 0.3$). The hydronephrosis spot is localized in the middle part of the right kidney and include the sinus, top of the pyramid and columnae. The spot is with ellipsoid or branched formations shapes (in advanced cases) and the size depends from the amount and time of the used steroid.

At the Fig 27 is presented the schematic spots formed from the steroid medications. Figures 28-37 are US pictures of the right kidney on the patients, which are used the steroid medications.

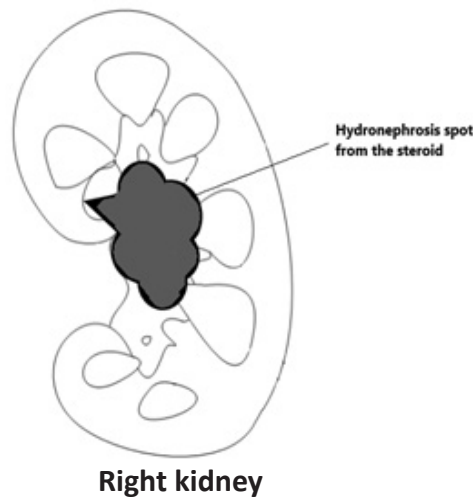


Figure 27: The schematic hydronephrosis spot from the steroid medication.

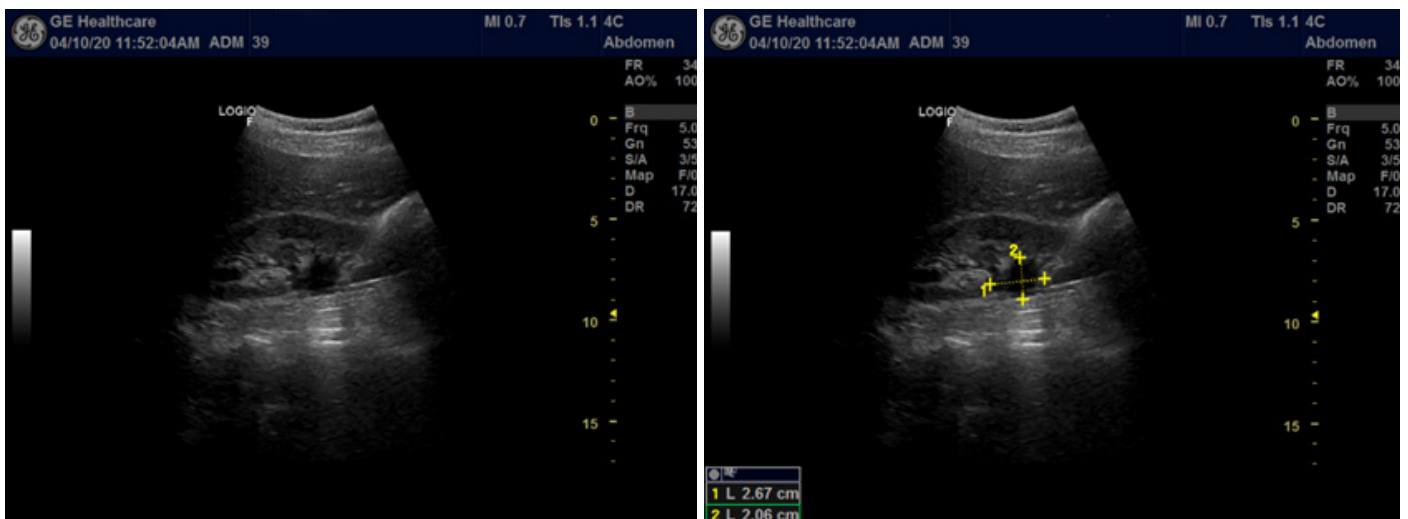


Figure 28: This is the 45 years old female after 2 years BCP and hormonal IUD for 11 years. The hydronephrosis spot in the middle part of the medulla of the right kidney – 2.6x2.0 cm.

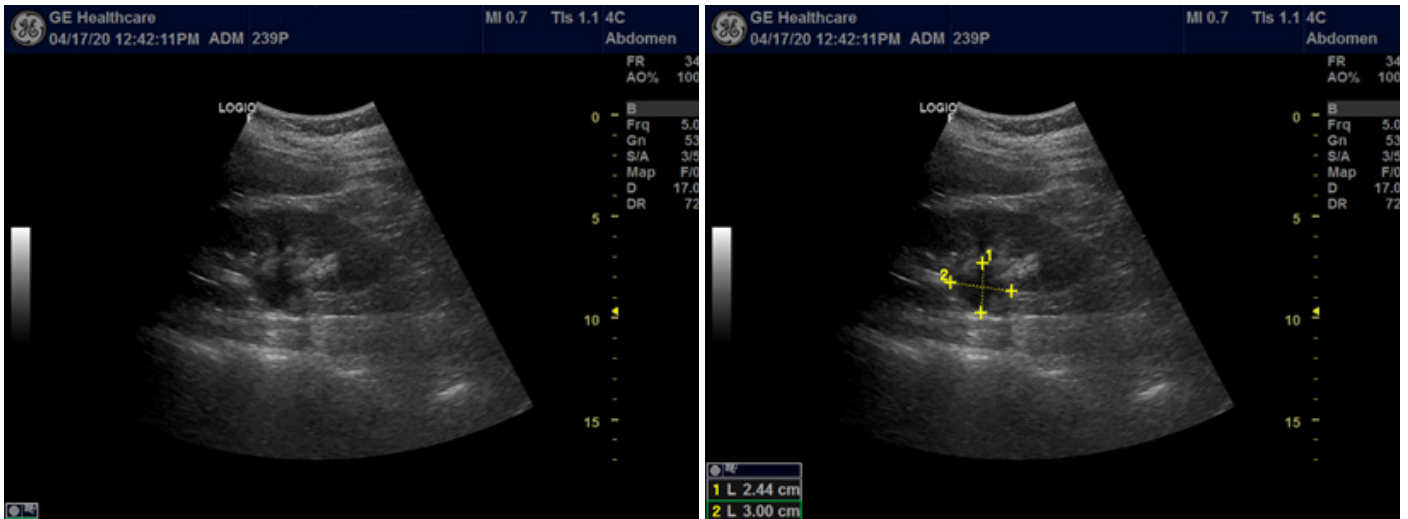


Figure 29: The ultrasound picture of the 47 years old female after 2 years BCP and Progesterone – 3.0x2.4 cm hydronephrosis spot at the middle medulla of the right kidney.

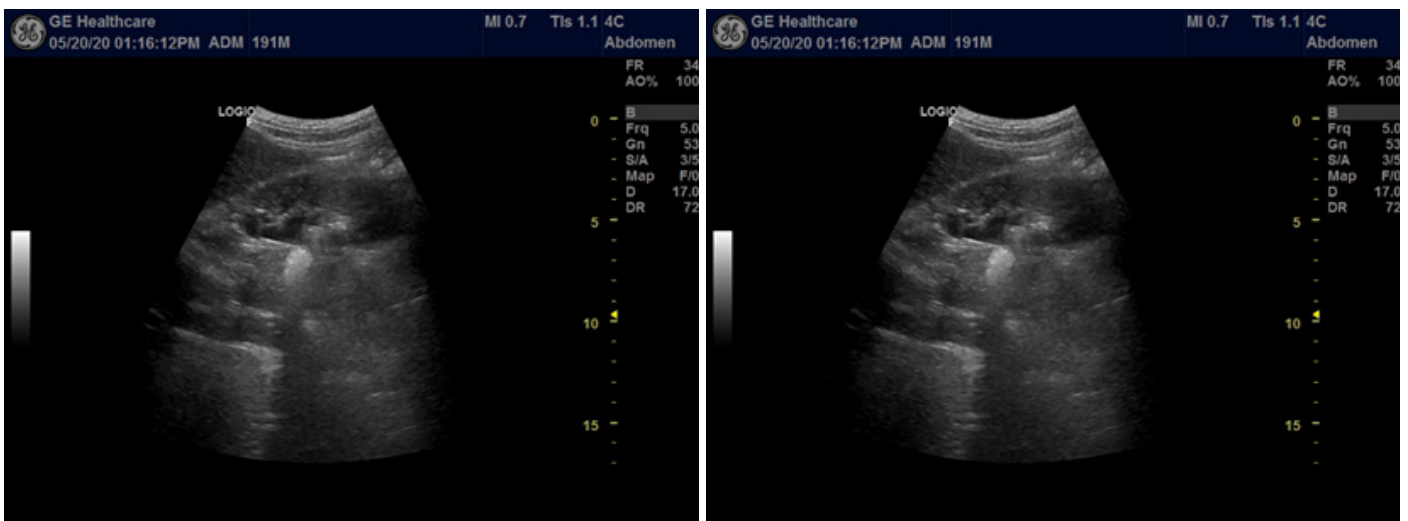


Figure 30: This is the 72 years female with the dermatomyositis after 3 months steroid course with Prednisone 40 mg. The right kidney has 3.2x1.5 cm hydronephrosis spot, at the middle to upper medulla.

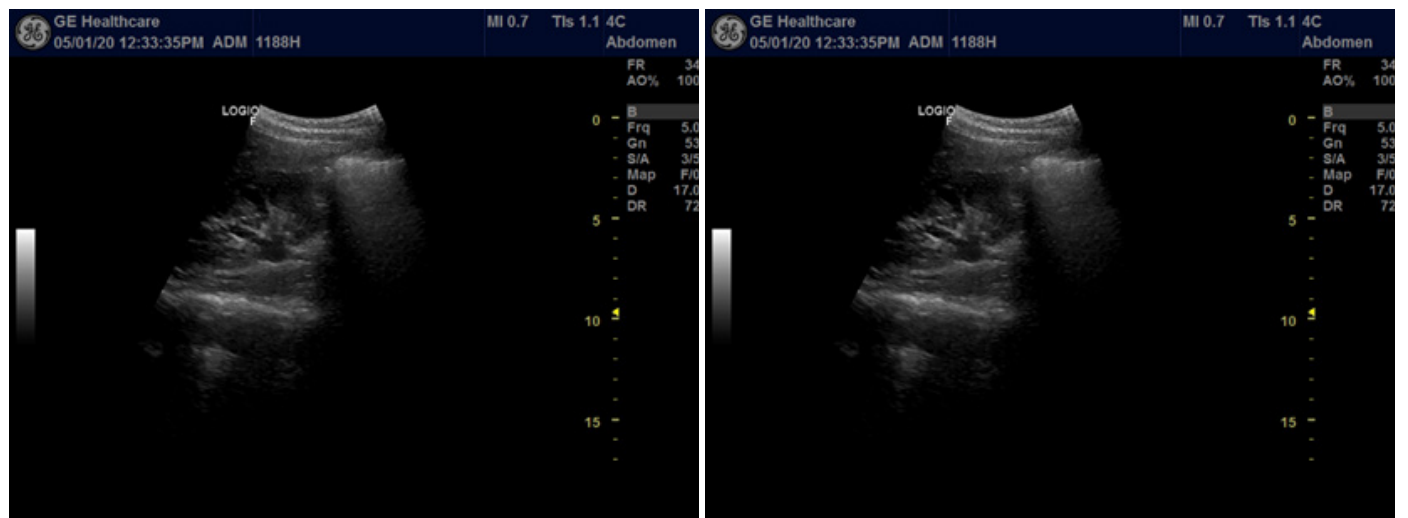


Figure 31: The ultrasound picture of the 27 years old female after 2 years steroid therapy for ALL (acute lymphocytic leukemia). The right kidney has the hydronephrosis spot and line, at the middle medulla, 3.0x1.4 cm.

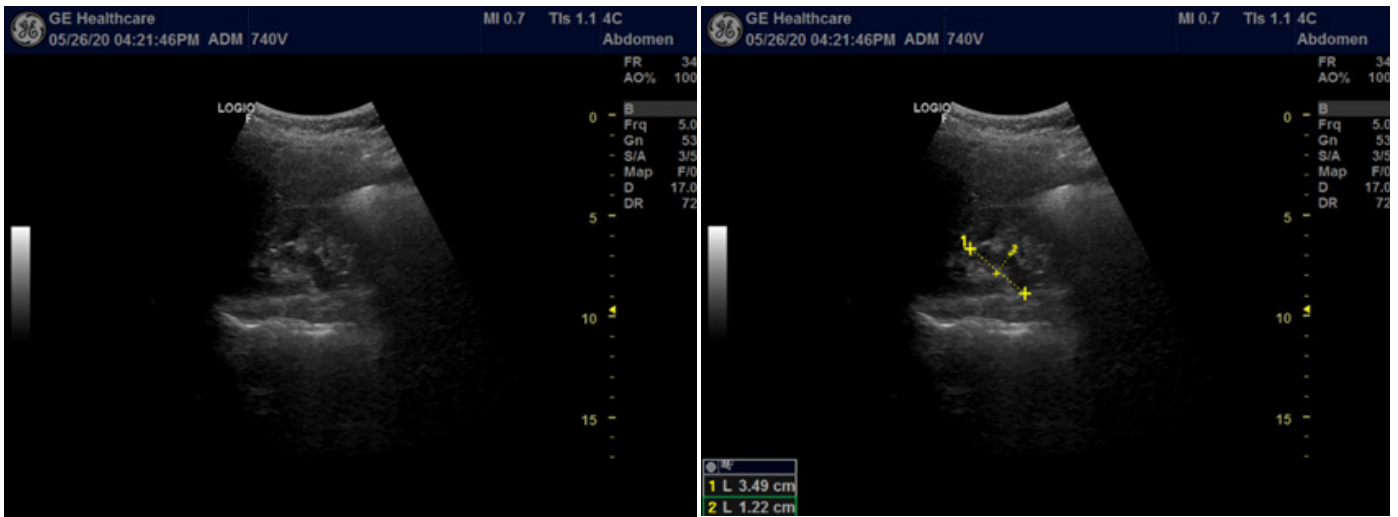


Figure 32: This is the 50 years old female that has used 12 years BCP and IUD with hormone. The right kidney has the 3.4x1.2 cm hypoechoogenic to hydronephrosis curved line at the middle medulla.

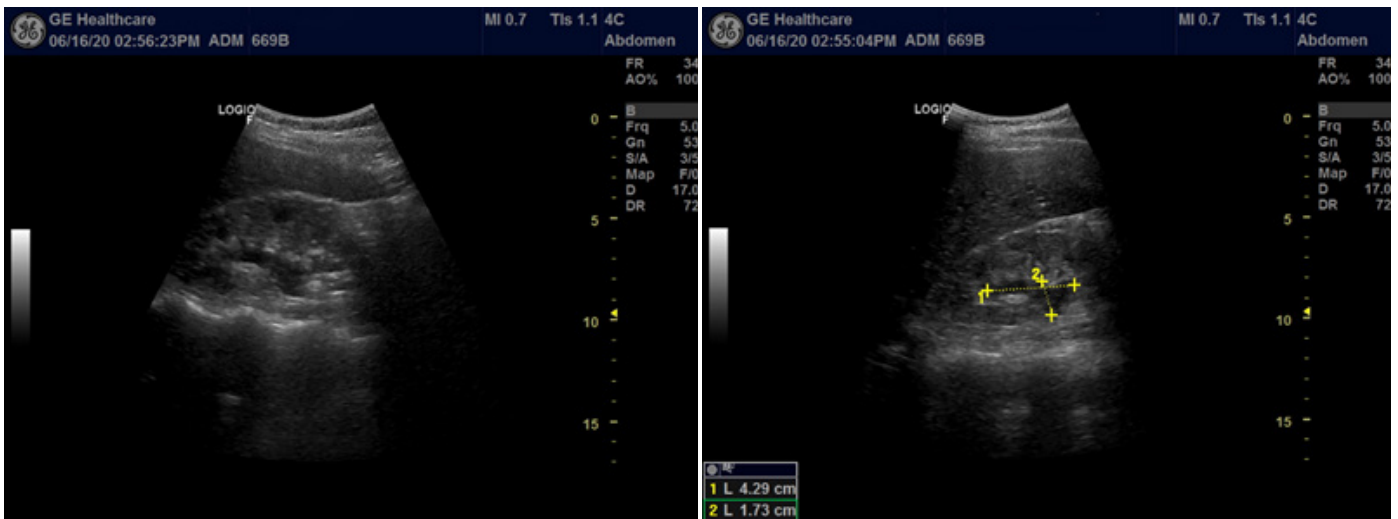


Figure 33 a. Right kidney



Figure 33 b. Left kidney

Figure 33 a, b: The ultrasound pictures of the 33-year-old female who has used 5 years BCP and Progesterone in the beginning of the pregnancy. The right and left kidney have the hydronephrosis spots at the middle medulla, 4.2x1.7 cm at the right kidney and 5.0x1.9 cm at the left kidney. The patient developed the kidney insufficiency after the delivery.

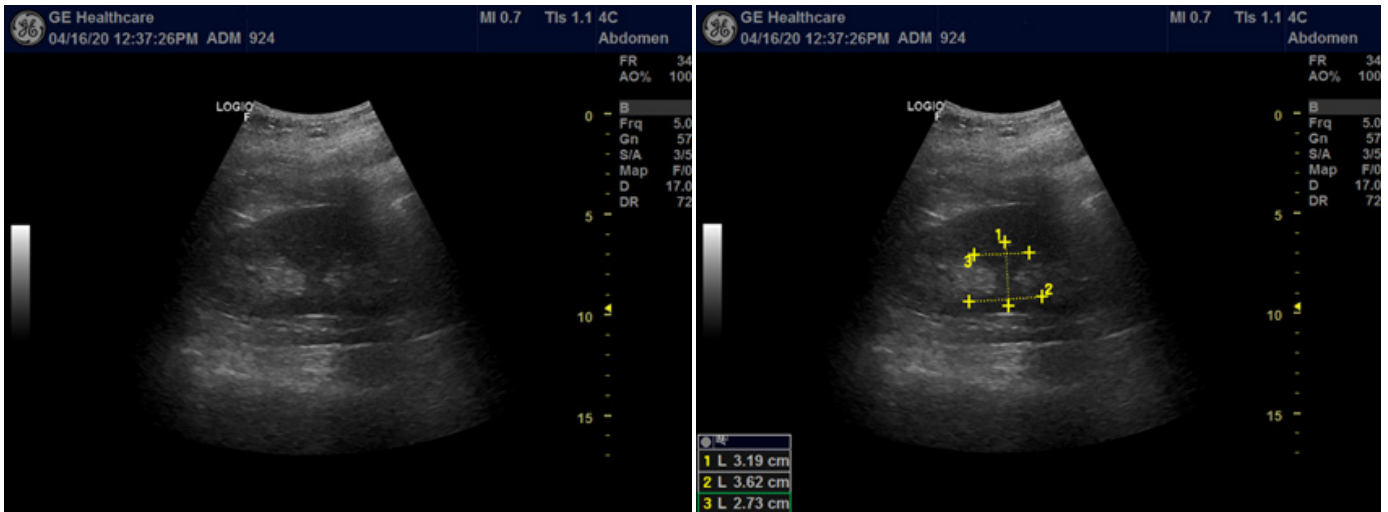


Figure 34: This is the 65 years old female after chemo therapy for the cancer (included steroid) – hypoechoogenic bridge at the right kidney, 3.6x3.1x2.7 cm.

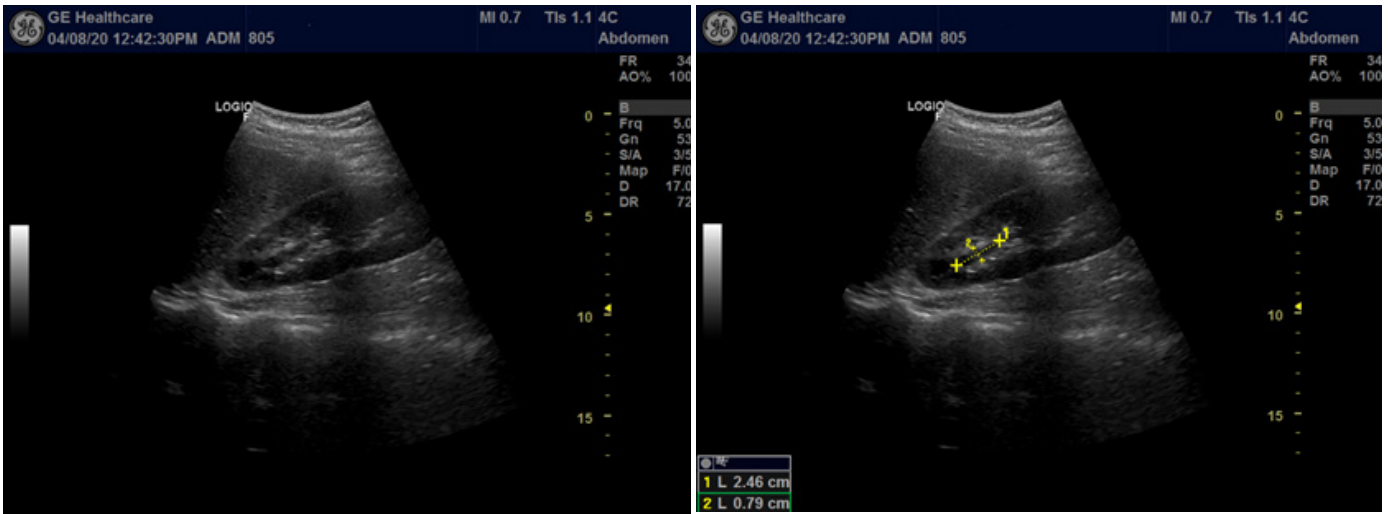


Figure 35: This the 34-female patient on the BCP for 3 years and Cortisol injection. At the upper pole of the right kidney has formed the hypoechoogenic to hydronephrotic line 2.4x0.7 cm.

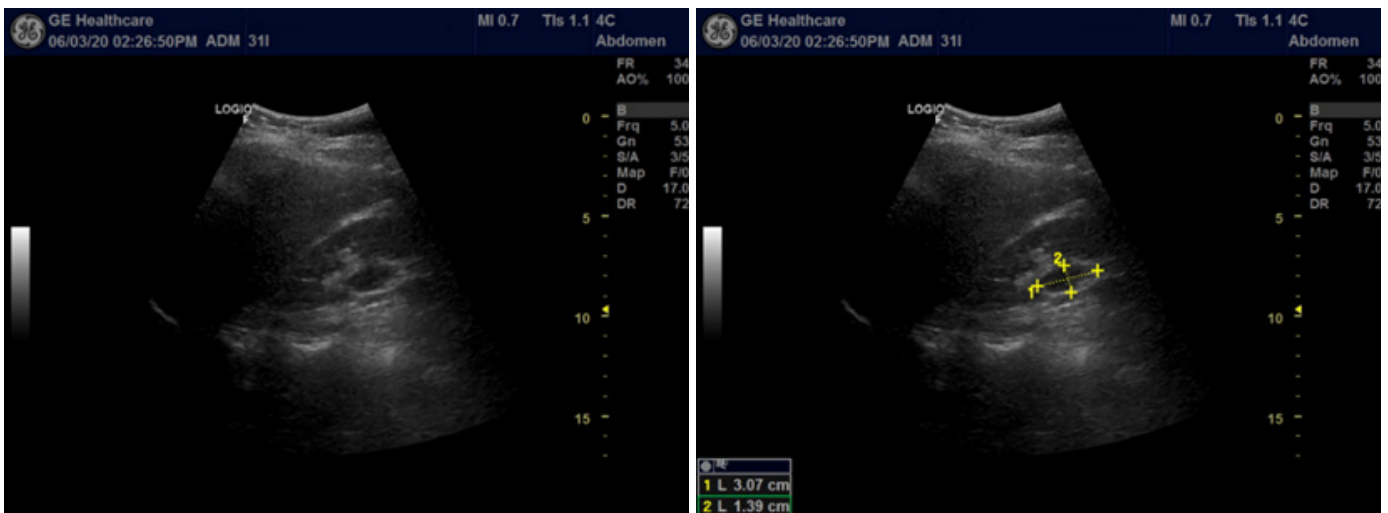


Figure 36: The ultrasound pictures of the 52 years old female have used for 1-year Progesterone. The right kidney has hydronephrosis spot at the middle medulla, 3.0x1.3 cm.

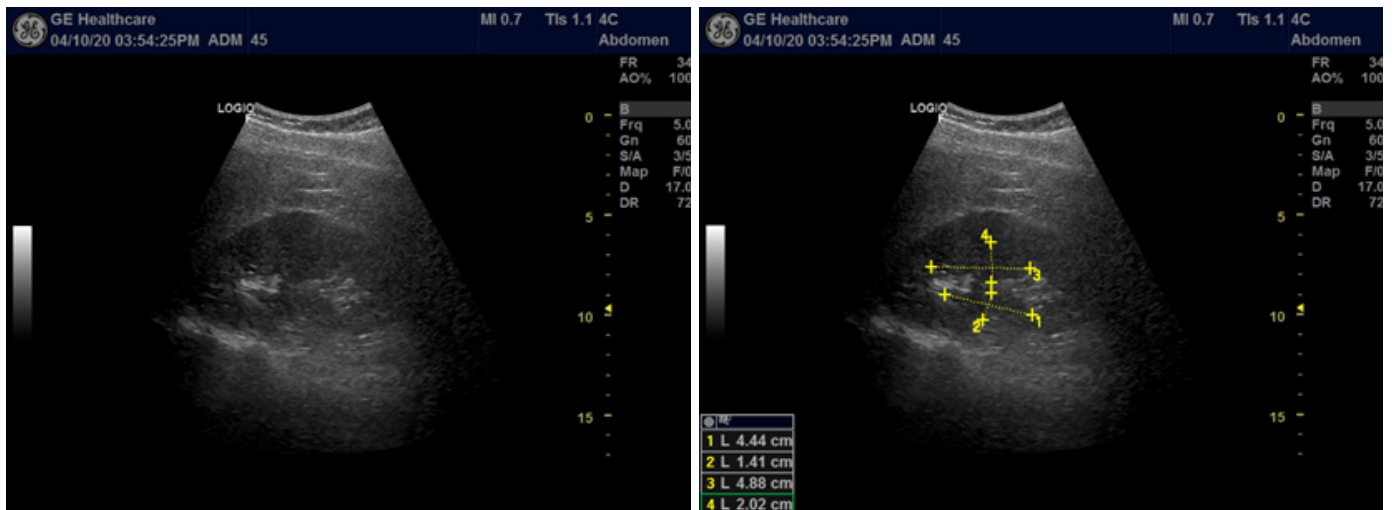


Figure 37: This is the 24 years old male after 6 months the testosterone and protein shakes – 2x hypoechoic zones in the middle medulla of the right kidney, 4.4x1.4 cm (testosterone, 1x2) and 4.8x2.0 cm (protein shakes, 3x4).

Analysis of the data

The analysis of the kidney structure changes from the steroid were performed on 82 patients, 75 females, from 11 to 87 years old and 7 males, from 24 to 62 years old. All patients which have used the steroid therapy has had the changed structure at the middle medulla of the right kidney – hydronephrosis spot with ellipsoid or branched formations shapes ($p<0.3$) (Table 1). When the steroid therapy was performed many years ago, 10, 20 or more years in some patients were seen the process of the replacing of the hydronephrosis spot with the tissue, but this tissue still to be with clear distinguished structure.

- 1) Using of the steroid (BCP-birth control pill, IUD-intrauterine device, Levothyroxine) from 2 month to 15 years period for BCP, from 4 to 12 years for IUD and 6 months to 36 years for Levothyroxine at the females create a hydronephrosis spot at the middle part of the right kidney medulla, with the dimensions (for all kind steroid): max. 5.0x2.2 cm and min. 1.5x1.2 cm ($p<0.3$).
- 2) Using of the steroid (Cortisol) from 1 to 2 injections or tablets

5-40 mg, for 7 days to 2 years treatment period, at the males create a hydronephrosis spot at the middle part of the right kidney medulla, with the dimensions: max. 4.8x 2.0 cm and min. 2.0x1.5 cm ($p<0.3$).

The structural kidney changes to the nonsteroidal painkillers

The nonsteroidal painkillers are one of the most used medications in the medicine. Using of the nonsteroidal painkillers for the long time have the ability to change the structure of the lower part of the left kidney ($p<0.4$). They form the lines with loose or hydronephrosis structure. The size depends from the amount of used painkiller. At the Figure 38 is presented the schematic spots formed from the nonsteroidal painkiller medication. Figure 39-42 are the US pictures of the left kidney on the patients, which are used the nonsteroidal painkiller medications.

Analysis of the data

The 29 patients, 17 females, from 15 to 73 years old and 12 males, from 18 to 58 years old were analyzed. All of the patients who

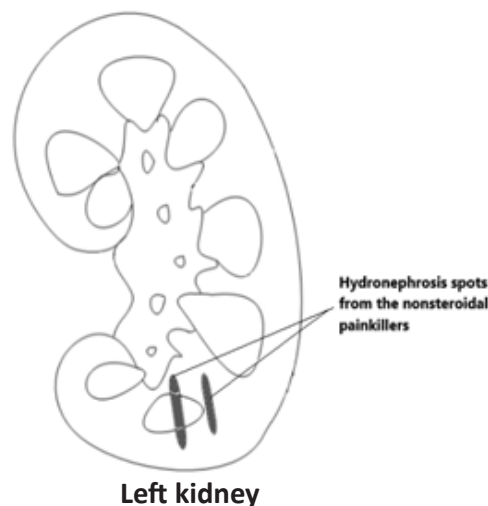


Figure 38: The schematic hydronephrosis spots from the nonsteroidal painkiller.

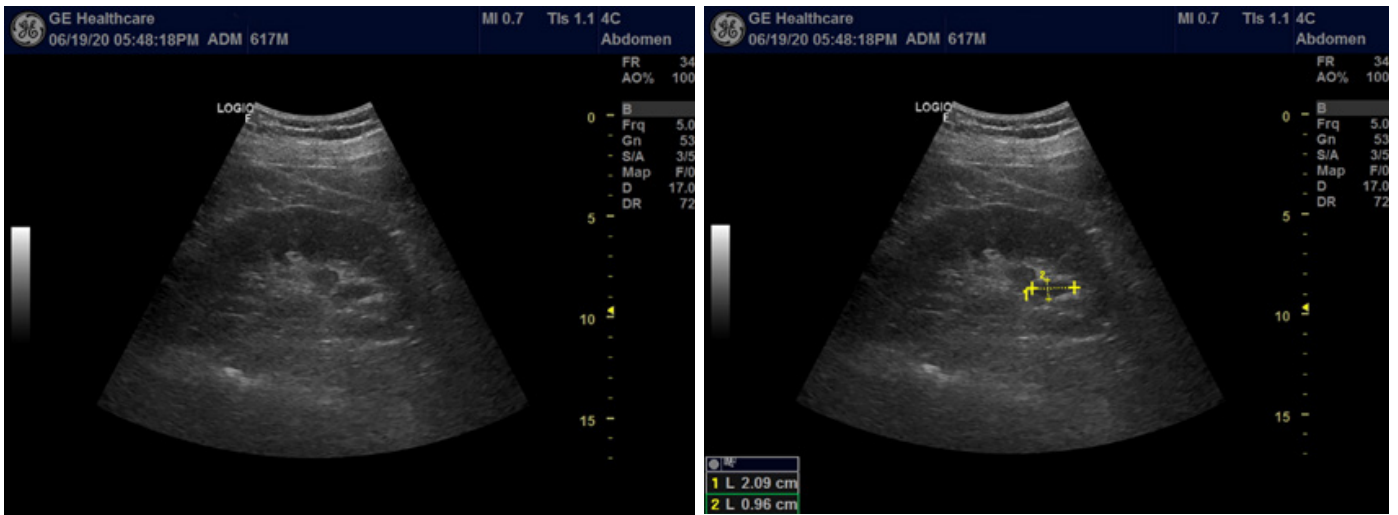


Figure 39: The ultrasound pictures of the 47 years old male who has used Advil 2-3 weekly in the last 2 years. The left kidney has the hydronephrosis line, with dimension 2.0x0.9 cm.

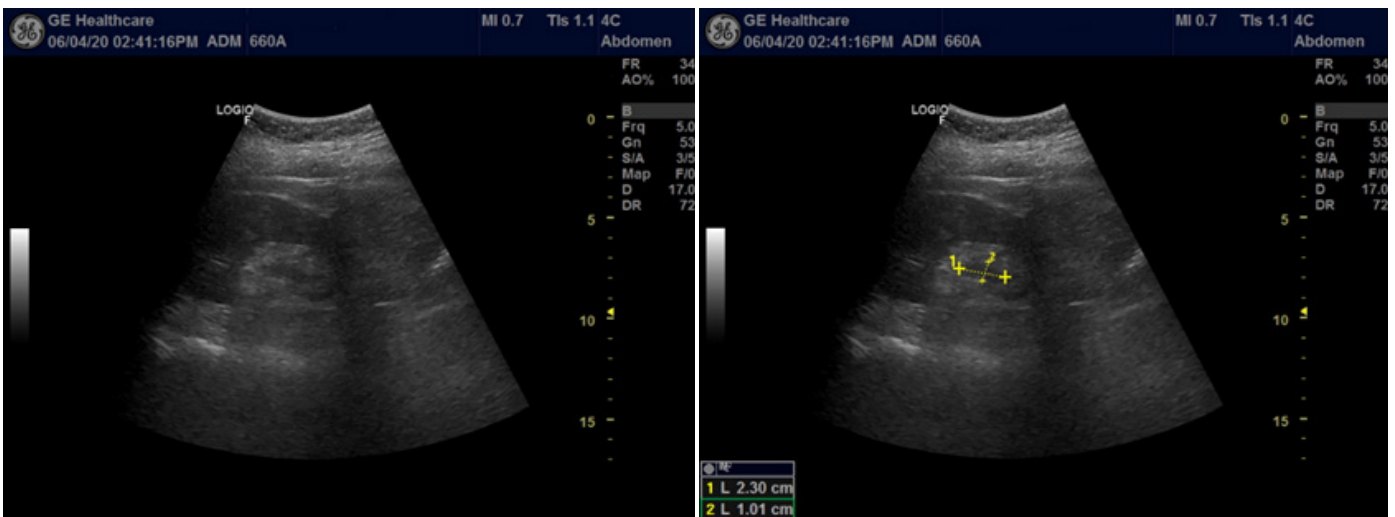


Figure 40: The ultrasound pictures of the 48 years old female who has used 1-2 tablets daily Advil or Ibuprofen in the last 1 year for the headache and spine pain. The left kidney has the hypoechoic line at the lower pole, 2.3x1.0 cm.

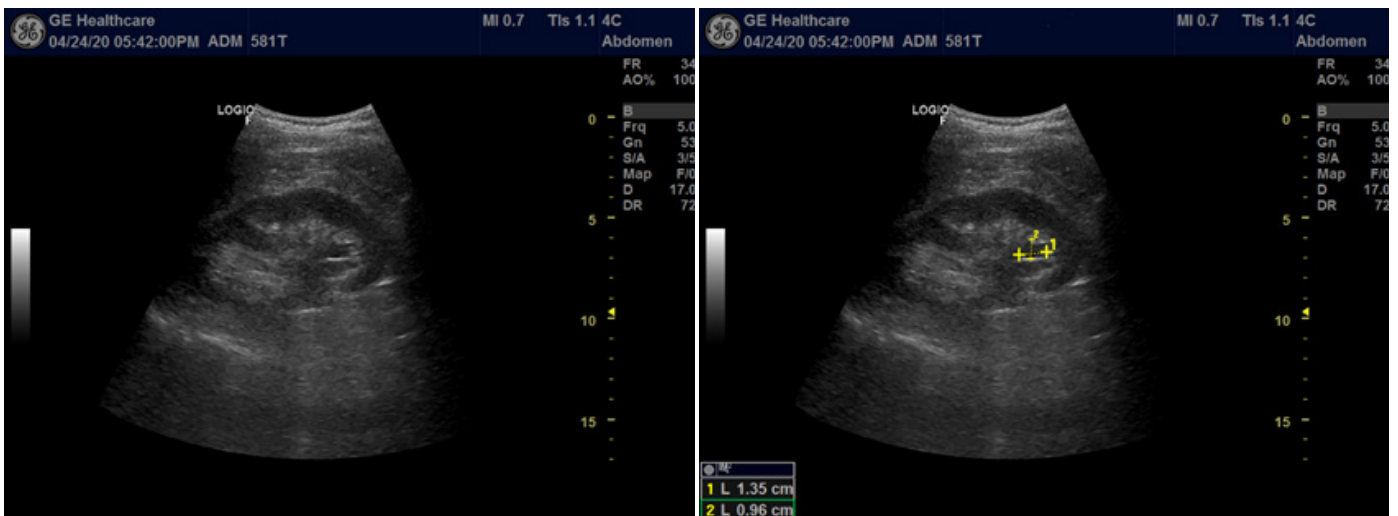


Figure 41: This is the 54 years old male after 7 days Ibuprofen use for the tooth implant procedure. The left kidney has 2 hypoechoic lines at the lower medulla, was measured the upper line 1.3x0.9 cm.

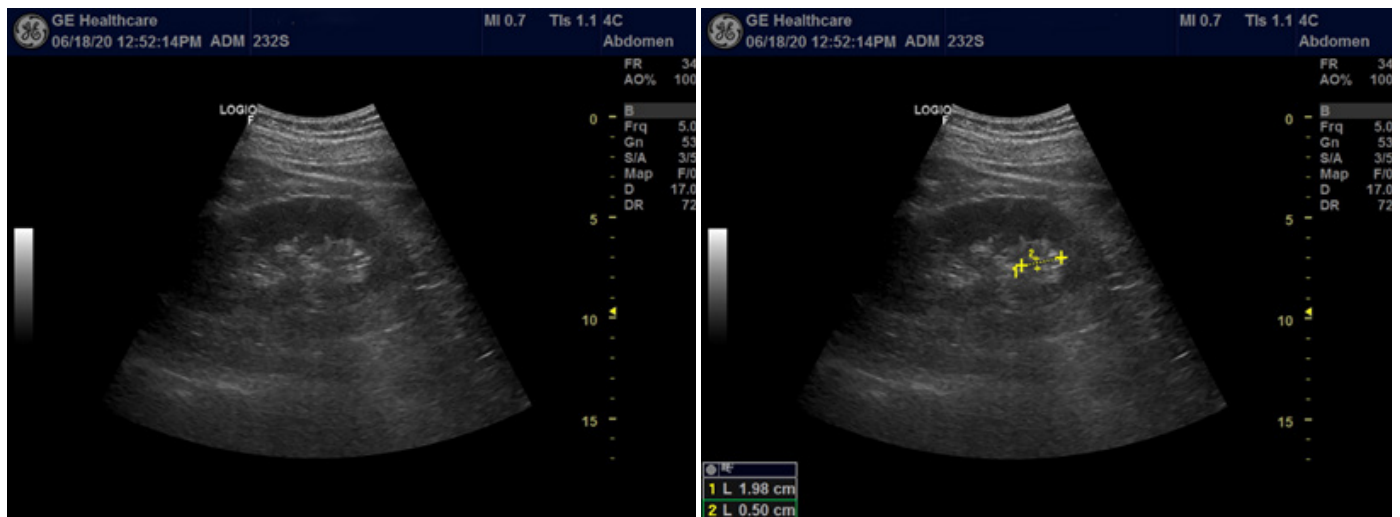


Figure 42: This is the 44 years old male who is taking Advil 2-3 times weekly for the neck pain. The left kidney has the hydronephrosis line, with a dimension 1.9x0.5 cm.

used the nonsteroidal painkiller medication (Advil) are formed the loose (hypoechoogenic) or destroyed (hydronephrosis) structure lines at the lower part of the left kidney ($p < 0.4$).

1) Using of the nonsteroidal painkiller medication (Advil), 1-2 tablets daily, from 2 days to 20 years period, at the females create a hypoechoogenic to hydronephrosis line at the lower part of the left kidney medulla, with the dimensions: max. 2.6x 1.7 cm and min. 1.4x0.3 cm ($p < 0.4$).

2) Using of the nonsteroidal painkiller medication (Advil), 1-2 tablets daily, from 3 days to 8 years period, at the males create a hypoechoogenic to hydronephrosis line at the lower part of the left kidney medulla, with the dimensions: max. 3.7x 1.4 cm and min. 1.3x0.9 cm ($p < 0.4$).

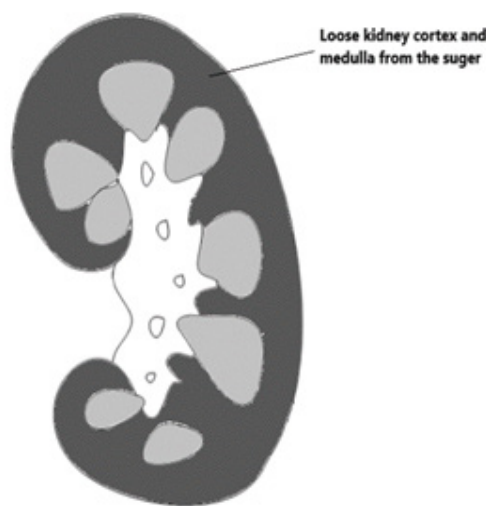
The structure kidney changes from the sugar

The eating too much sweet food (chocolate, candy, cakes, cracker, dry and very sweet fruits, honey, alcohol) changes the structure of the kidneys in a specific way. The most affected part of the kidneys is the cortex. The cortex of the both kidneys are with very loose (hypoechoogenic) structure, the right kidney more as the left one ($p < 0.3$).

At the Figure 43 is presented the schematic loosed structure of the cortex from the sweet food. Figure 44-45 are the US pictures of the right and left kidneys on the patients who have used the sweet food.

Analysis of the data

The analysis of the kidney structural changes from the sugar were performed on the 50 patients, 22 females from 30 to 77 years



Right and left kidney

Figure 43: The loose structure of the kidney cortex from the overeating of the sweet food.

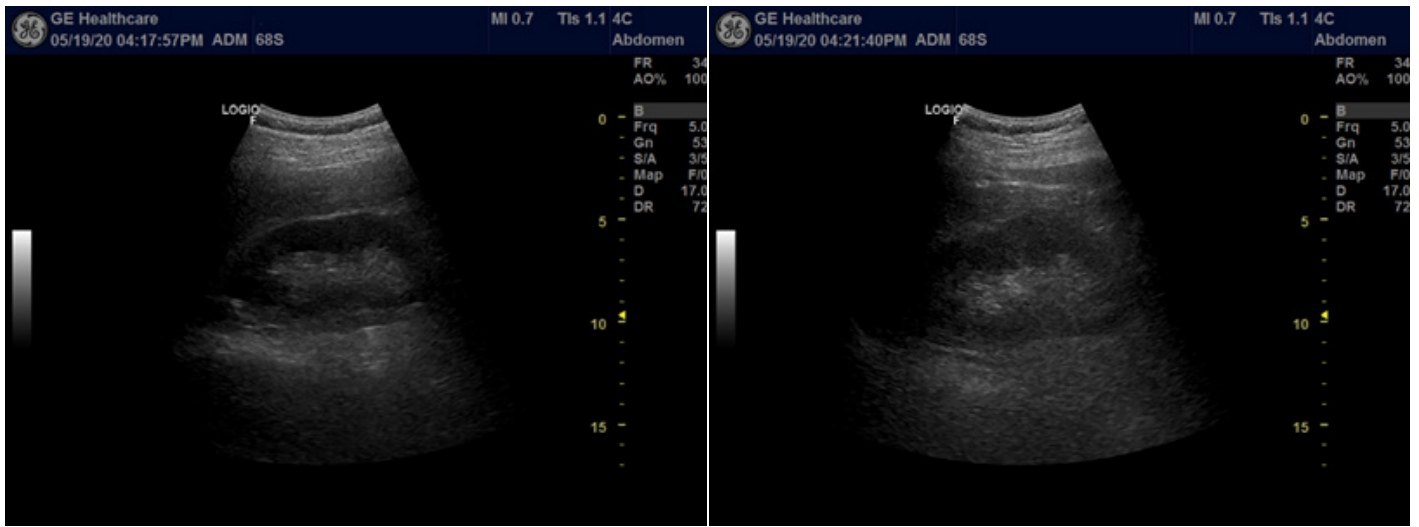


Figure 44: This is the 72 years old patient with 20 years medical history of the Diabetes mellitus, HbA1C 8.9-10.0 mmol/l, on the insulin therapy. The cortex of the right kidney is more hypoechoic as the cortex of the left kidney.

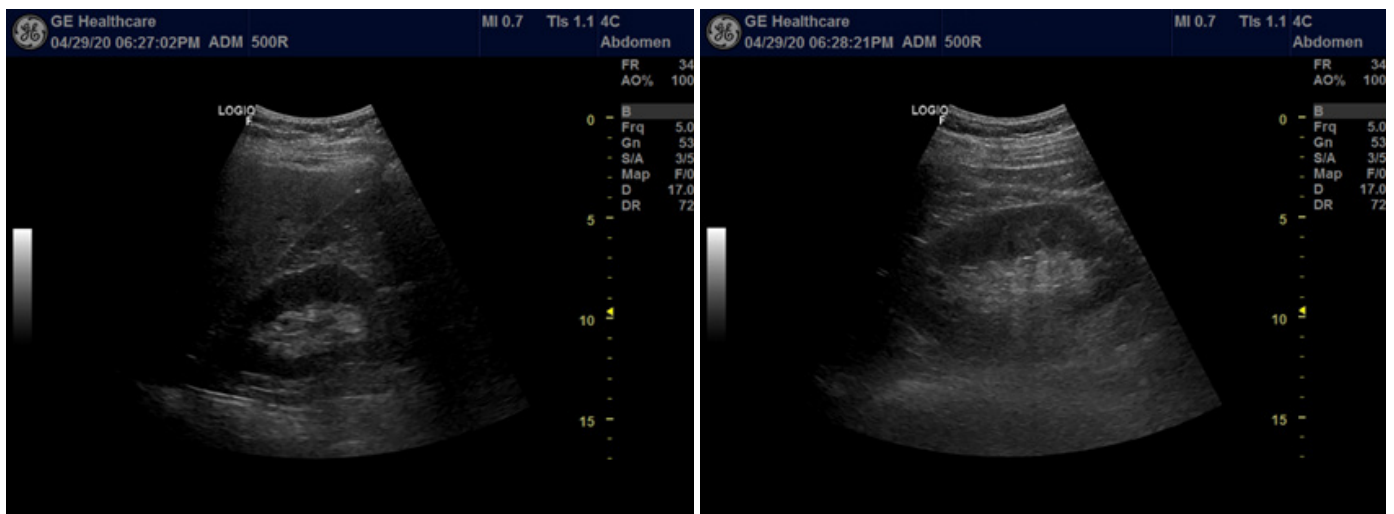


Figure 45: This is the 48 years old patient with Pre-Diabetes mellitus, Glucose 100-125 mg%. The cortex of the right kidney is more hypoechoic as the cortex of the left kidney.

old and 28 males, from 40 to 72 years old. The 19 patients were prediabetic (HbA1C: 5.6-6.4 mmol/l), 7 female and 12 males and 31 diabetics (HbA1C: 6.4-10 mmol/l), 15 female and 16 males.

Over using of the sweet food or higher level of the blood sugar affects the right and left kidney (prediabetic and diabetics patients). At the ultrasound diagnostics can be seen the hypoechoic structure of the cortex and medulla, right kidney more as the left kidney ($p < 0.3$).

The structure kidney changes from the antibiotics

The effect of the one antibiotic – Amoxicillin on the kidney structure at 24 patients were analyzed. Amoxicillin changes the

lower part of the middle medulla at the right and/or left kidney – hypoechoic spot ($p < 0.5$). The size of the spot depends of the taken dose and time. Figure 46- are the ultrasound pictures of the patients who have used the Amoxicillin.

Analysis of the data

The effect of Amoxicillin on the kidneys was analyzed in the 24 patients, 15 females, from 23 to 60 years old and 9 males, from 13 to 51 years old. The most of the patients have used the tablet 500 mg, 3 times daily, from 7 to 10 days. The hypoechoic spot at the lower part of middle medulla of the right and/or left kidney has the dimensions: max. 2.9x1.8 cm and min. 1.4x0.7 cm for females; max. 3.1x2.1 cm and min. 1.5x1.2 cm for males.

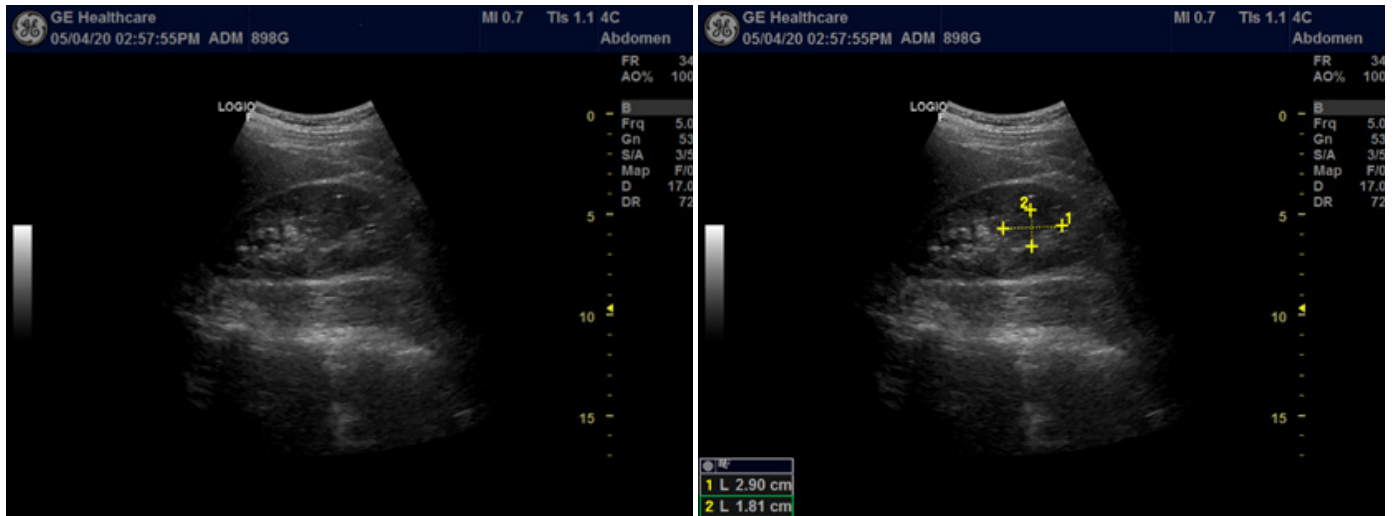


Figure 46: This is the 30 years old female after 10 days Amoxicillin, dental procedure. The right kidney has the hypoechoic spot at the lower part of the middle medulla, 2.9x1.8 cm.

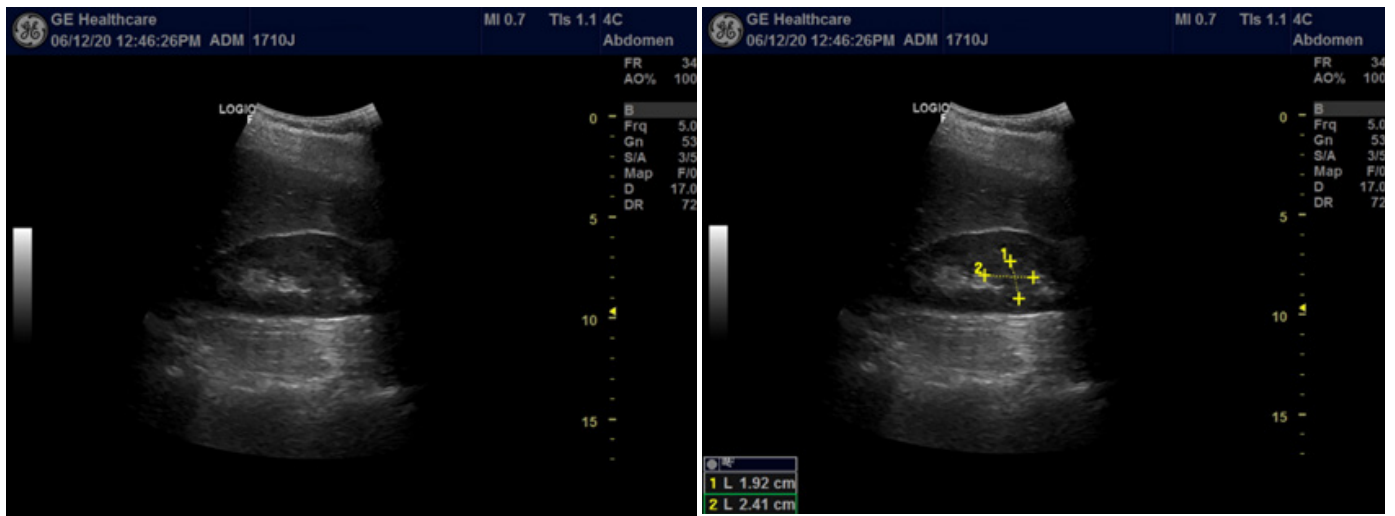


Figure 47. a. Right kidney – the hypoechoic bridge at the lower part of the middle medulla, 2.4x1.9 cm.

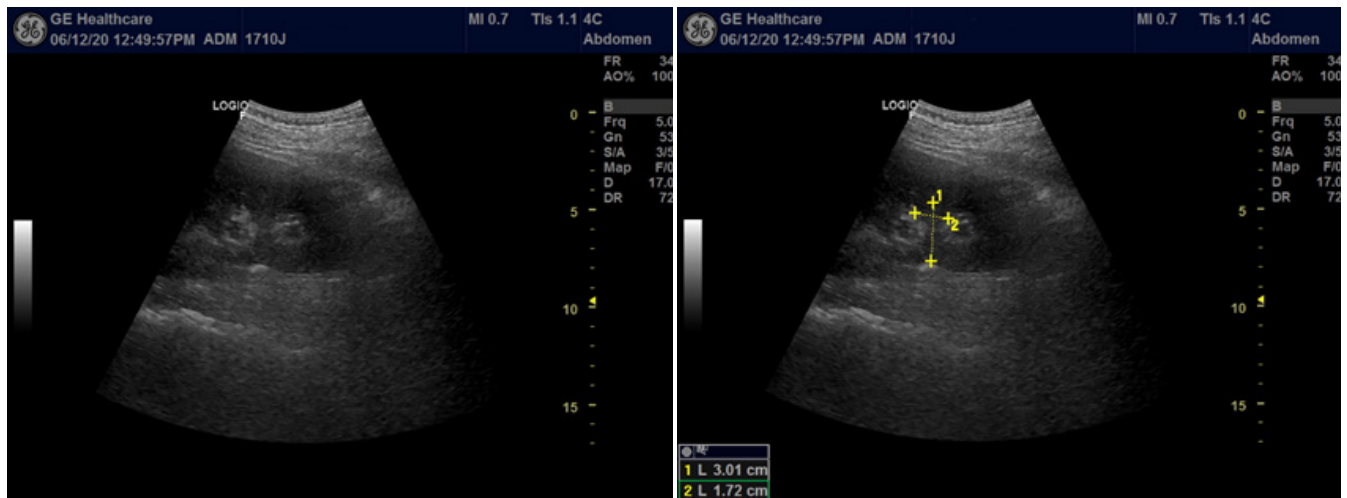


Figure 47. b. Left kidney - the hypoechoic bridge at the lower part of the middle medulla, 3.0x1.7 cm.

Figure 47 a. b. The ultrasound pictures of the 51 years old male who has used 1-month Amoxicillin and other antibiotics for the sepsis, 17 years ago. The right and left kidneys have the hypoechoic bridges through the lower medulla part. a. Right kidney, b. Left kidney.

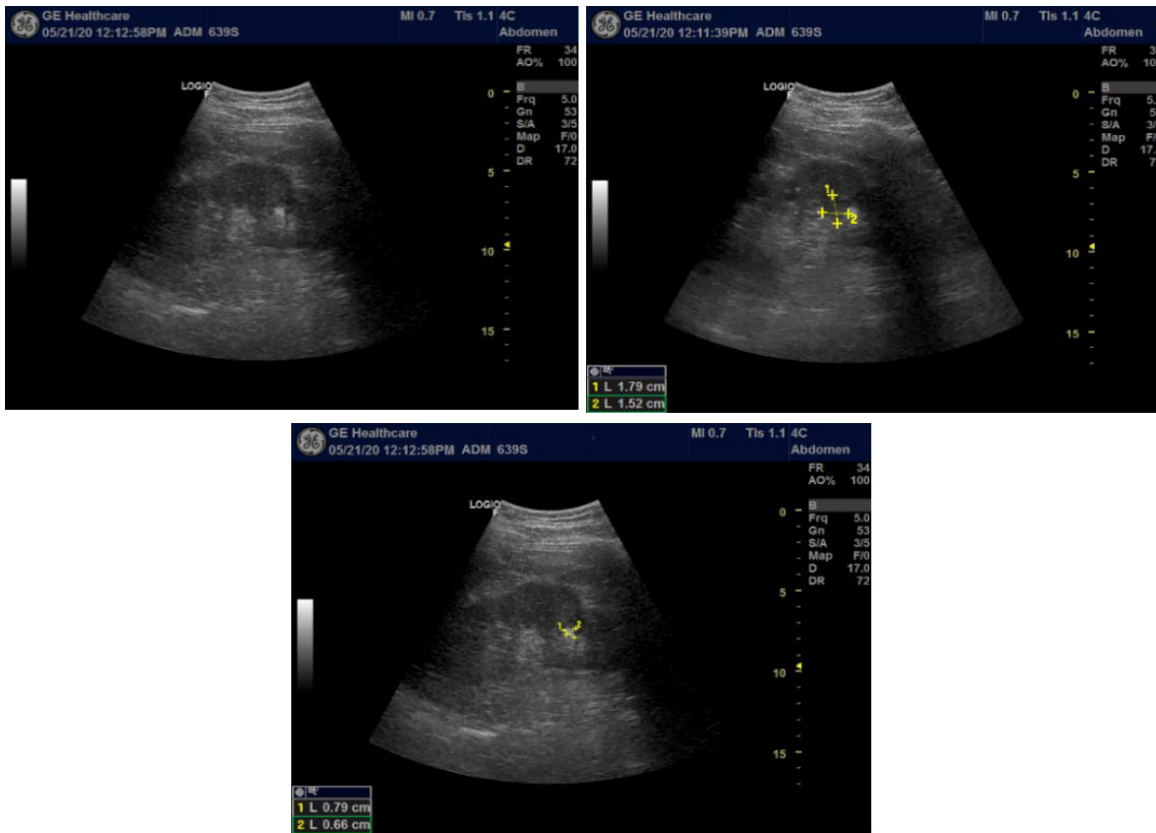


Figure 48: This is the 40 years male who has used the many kinds antibiotics at the child age (Amoxicillin, Doxycycline, Cephalexin). The left kidney middle to lower medulla has the 1.7x1.5 cm hypoechoogenic zone with hyperechogenic spot, 0.7x0.6 cm, from replaced functional tissue with calcified connective tissue.

The structure kidney changes from the marihuana

To see the effect of the marihuana on the kidney were analyzed the 14 patients, 5 females, from 30 to 55 years old and 9 males, from 28 to 60 years old. The females had used the marihuana 1-2 times weekly to 1 time every day, for 1 to 2 years. The males had used

marihuana 2-3 times weekly to 3 times every day, for 1 to 7 years. In all of the smokers was found the calcification lines in the kidney capsule, which give the hypoechoogenic, vertical lines throughout the right and/or left kidney ($p < 0.8$).

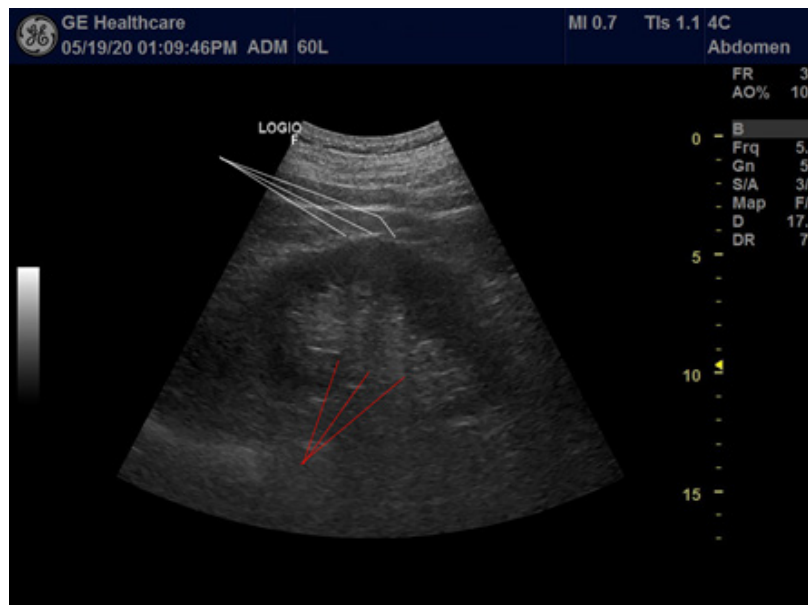


Figure 49: The ultrasound picture of the 40 years old male has used the marihuana. The right kidney has 3 vertical hypoechoogenic lines through the cortex, medulla and sinus (red lines) from the 3 calcifications in the tissue around the kidney capsule (white lines).

Chemical substances	Sex: Female – F, Male – M	Age - years	Time of using	Amount of used substance	Ultrasound specific changes at the kidneys – localization and dimensions
1. Coffee, Caffeine containing teas – 107 patients	F: 56 M: 51	F: 13-71 M: 20-75	F: 1-35 years M: 2-50 years	F: 1-7 cups M: 1-4 cups (1 cup- 20 oz)	Left kidney – hydronephroses spot in the upper middle part of the medulla and cortex Coffee: F: max. 4.1x2.2 cm; min. 1.6x1.4 cm, M: max. 4.6x2.2 cm; min. 1.7x1.5 cm Caffeine containing teas: F: max.2.4x1.8 cm; min. 1.3x1.2 cm, M: max. 3.4x1.5 cm; min. 1.9x1.2 cm
2. Protein shakes – 29 patients	F: 14 M: 15	F: 21 -70 M: 20-51	F: 1 month – 5 years M: 1 month – 30 years	F: 1 cup daily (40 oz) M: 1 cup daily (40 oz)	Right kidney – hydronephrosis spot at upper part of the kidney F: max. 4.2x1.9 cm; min. 1.7x1.5 cm, M: max. 5.2x2.9 cm; min. 1.7x1.4 cm
3. Carbonated beverages (mineral carbonated water, soda, cola, red bull, sprite) – 53 patients	F: 26 M: 27	F: 13-61 M: 18-69	F: 2 months – 20 years M: 3 days – 30 years	F: 1 cup (20 oz) – 2 cups (40 oz) daily M: 1 cup (20 oz) – 8 cups (160 oz) daily	Right kidney – hydronephrosis lines through the kidney length F: max. 5.5x0.9 cm; min. 1.4x0.7 cm, M: max. 4.9x0.9 cm; min. 1.5x1.0 cm Left kidney – hydronephrosis lines through the kidney length F: max. 4.1x1.5 cm; min. 1.8x0.5 cm, M: max. 4.4x2.3 cm; min. 1.9x0.7 cm
4. Sweet food (sugar) – 50 patients	F: 22 M: 28	F: 30-77 M:40-72	Prediabetic - 19 patients F: 7; M: 12 Diabetic – 31 patients F: 15; M: 16	Prediabetic – HbA1C: 5.6-6.4 mmol/l Diabetic – HbA1C: 6.4-10 mmol/l	Right and left kidneys - hypoechogenic structure of the cortex and medulla, right kidney more as the left kidney.
5. Steroid (BCP-28, IUD-29, Levothyroxine-6, Cortisol-18) – 82 patients	F: 75 M: 7	F: 11- 87 M: 24-62	BCP: 2 months – 15 years; IUD: 4-12 years; L-Thyroxin: 6 months-36 years; Cortisol: 1-2 injections; 7 days to 2 years pills	IUD: Mirena 52 mg, Levothyroxine: 50-175 µmg, Cortisol: 5-40 mg	Right kidney - hydronephrosis spot at the middle medulla from all kind steroid F: max. 5.0x2.2 cm; min. 1.5x1.2 cm, M (Cortisol): max. 4.8x2.0 cm, min.2.0x1.5 cm
6. Non steroid antiinflammation medications (Advil, Ibuprofen) – 29 patients	F: 17 M: 12	F: 15-73 M: 18-58	F: 2 days-20 years M: 3 days- 8 years	F: 1-2 tablets daily (Advil, Ibuprofen – 200 mg) M: 1-2 tablets daily (Advil, Ibuprofen – 200 mg)	Left kidney - hydronephrosis line in lower part of the medulla F: max. 2.6x1.7 cm; min. 1.4x0.7 cm, M: max.3.7x1.4 cm; min.1.3x0.9 cm
7. Antibiotic (Amoxicillin) – 24 patients	F: 15 M: 9	F: 23-60 M: 13-51	F: 7-10 days M: 7-10 days	F, M: 500 mg 3 times daily; for 13 years old boy – 250 mg 3 times daily	Right and/or left kidney – hydronephrosis spot in the lower-middle part of the medulla F: max. 2.9x1.8 cm; min. 1.4x0.7 cm, M: max. 3.1x2.1 cm, min. 1.5x1.2 cm
8. Marihuana – 14 patients	F: 5 M: 9	F: 30-55 M: 28-60	F: 1-2 years M: 1-7 years	F: 1-2 times weakly to 1 time every day; M: 2-3 times weakly to 3 times every day	Right and/or left kidney – hypoechogenic, vertical lines through cortex, medulla and sinus, calcifications in the kidney capsule

Table 1: Ultrasound evidences for the toxic changes of the kidneys from the different chemical substances. BCP – birth control pills, IUD - intrauterine device with the hormone.

Conclusions

- The analysis of the information from the medical history and the ultrasound pictures of the kidneys on the 385 patients show that the deferent chemical substances have the ability to change the specifically part of the kidneys with the specific shape. The size and stage (hypoechogenic to hydronephrosis) of the pathologic changes depends from the amount and time of the used substance.
- The deferent chemical substances have the ability preferentially to change the deferent places of the kidney structure – left or right kidney, or both. This means that the left and right kidney have the deferent structural and functional specialization. For the first time about it was written in the Chinese Traditional Medicine, more of the 21 centuries ago. At the theory of the zang fu organs the left and right kidney are presented with the deferent function. Restoring the Left Kidney Pill (Zuo

Gui Wan) is the herbal formula to nourish Kidney Yin and Kidney Essence. Restoring of the Right Kidney Pill (You Gui Wan) is the herbal formula to tonify the Kidney Yang [1]. The development in the diagnostic ability of the Western medicine give us ability to verify the many theories and stand-points of the Eastern medicine.

Acknowledgements

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