Exact location of loop of henle

Doubtnut does not own or control the nature and content of those questions. The exact location of the Loop of HenleLoop of Henle: work in the medulla of the kidneys and connect the confusing pipes in the vicinity, and the confusing pipes, there is an error in the question or solution? In order to continue to enjoy our website, we ask you to confirm your identity as a human being. Thank you very much for your cooperation of Henle's loop (LoH) as a long straight and straight pipe section connecting the pipe close to the collapsed pipe and parallel to the storage pipe. LoH is descended from the cortex, or medulla (depending on the size / length of the nephron) into the papilla of the kidneys. These groups are characterized by the morphology of cells and anatomical positions, but also correlated with the function, approximately 15-25% of the filtered NaCl is then reabsorbed through LoH mainly through the limbs up thick loH plays an important role in the concentration of the urinary tract by participating in the formation of hypertonic interstitium medullary in a process called countercurrent multiplication. Read more: Many ancestors, single ancestors, no offspring, evolved from one part of the parents across the destination Nav The purpose of this article is to analyze the historical reasons why nearly a hundred years passed between henle's loop discovery in the last century and our understanding of the function of physiology In the mid-nineteenth century, at a time when anatomical microscopes were rapidly developing in Germany, adopted Rudolf Virchov to propose cell theory of tissue organization in 1858 - Jacob Henle (1809-1885) is examining the hematological anatomy of kidney tissue. From 1862 onwards, he explained in a series of publications, the presence of pipe loops that work perpendicular to the kidney surface and drilled at variable depths in the medulla, the descending part of these loops has a small outer diameter (thin limbs). Compared to the ascending part, which is located in the outer medulla (thick limbs), Figure 1 illustrates the illustrations published by Henle in 1866 [1]: observe the incredible precision of those handmade paintings. They show a short section of certain limbs (Figure 1A) of thick limbs (Figure 1B) and a change of thin to thick limbs (C). And those who support the 'secretion theory' (known as vitalists) turn in a new tab down the slideTubular loops of the rabbit kidney, as described by Henle [1], the figure on the right shows some hairpin limbs pierced at variable depths in the papilla (a) piece of thin limbs (B), parts of thick limbs and (C) some limb transitions up to Claude Bernard (1813-1878) gave his personal thoughts on this controversy: 'We don't have to pay attention to those theoretical views, which consider the formation of urine as an important process: they do not provide any hope for critical analysis; but we will examine the relevance of the mechanical theory of circulation; They may be mistaken for theories because they neglect one aspect of the question, but they have a clear and easy-to-understand formula,' as later stressed by Homer Smith (1895–1962). 'Over the next 50 years, the relevant nature of glomerular activity and pipelines were debated back and forth without conclusive evidence to settle the arguments' from 1916 onwards, British pharmacist Arthur Cushny (1866–1926) was heavily involved in appeasement by this one-stop theory, which he called 'modern theory'. From his point of view, urine is caused by simple ultrafiltration in glomeruli, and its composition is modified by the selected reabsoption process as it flows along the tubular part, as stated by Homer Smith [3; p. XXI]:'By the overall theoretical principle, it is very interesting for detectives, mainly because it treats the kidneys as an organ of constant and predictable functions such as muscles and nerves.' It should be mentioned at At this point, in the meantime (1909) Klaus Peter [5] has reported that henle loops are present only in the mammal's kidneys, and they have been developed in greater proportions in species that live in dry habitats and produce concentrated urine. Over the two decades after the introduction by Cushny's theory of 'reabsorption filtration', kidney physiology has progressed relatively quickly due to the fact that two new experimental methods adapted to the analysis of kidney function are ongoing. (i) By developing micropuncture techniques in amphibious kidneys and various micromethods needed to analyze the composition of fluid in the pipeline, Alfred N. Richards (1876-1966) and colleagues [6,7] were established, among other results (a) that glomerular filtration contains the chemically expected composition of ultraviolet (1966). b) that approximately 2/3 of the amount of salt and filtered water is reabsorbed along the nearby pipe, so that the pipe fluid remains isotonic to the plasma in this part, and (c) that, in contrast, the walls of the distal pipe can penetrate badly with water, so that the pipe fluid becomes visibly hypotonic to the plasma, according to this part, as a result of reaborp salt in 1941. Walker and his colleagues [8] successfully expanded the micropuncture. To my kidneys. Their data, which relates to most nearby pipes, is similar to those received in amphibious (ii) on J. A. Shannon and Smith demonstrated in 1935 that the clearance of inulin was an accurate measurement of glomerular filtration rates not only in mammals, but in humans as well, such as Cin=(U.V/P) in =GFR. (The overall duct flux of S) because: TS = Cin× (S) p-V× (S) u to obtain this information is enough to inject inulin to collect urine and measure the concentration of inulin and S in the urine (S) u, and red blood plasma samples (S)p kidneys untouched in this way so that the method can be applied to humans. But in contrast to micropuncture data, when measuring duct clearance remains a type of 'black box' that measures net input and output of S until the end of the 1940s, the systematic use of both complementary methods allowed to gather large amounts of experimental data, which was summarized and discussed by Homer Smith on the treatment of kidney structure and health and disease functions published in 1951[3]; this is the 'Bible' for my kidney physiologists. It may be worth recalling at this point that when Smith wrote his book, the nature of the mechanism responsible for transporting the pipes (whether reabsorption or ejaculation) is still unknown. Net flux is carried out with an electrical chemical gradient called 'active transport', although we still don't know how to produce energy or use it in pipeline excretion (such studies have just begun). There is in our opinion that there is no significance of power and the word secretion. Stripped of old ambiguity may act as a convenient synonym for it. '3; p. XVI] Homer Smith's view on the site and the mechanism of urine concentration and dilution within the mamalian kidney were inferred from the micropuncture data in amphibious. This high-profile diffron includes a short 'thin portion' but no hoops of hendle as a result of the marked reabsorption of salt formed along the liquid's near-fluid tube sending to a thin part is assumed to be a slight hypotonic to the plasma as homer Smith [3; p. 243]:'It may be assumed that, as far as the license time, water is distributed from this hypotonic urine back into the blood as a result of differences that occur in the mmoonic pressure. Further metastasis occurs in the thin part of the henle loop, which is functioning which is now considered to promote the balance of osmotics between the urine, the uretic and blood, before the urine is sent to the distal' tube in the absence. The hormone (ADH), the distal nephron part can not pass through to the water, so that the active reabsorption of salt along those parts results in the formation of the final urine diluting large quantities. In the presence of ADH, the distal part can penetrate to the water, so that one should get a dose of urine. In order to account for the formation of hypertonic urine in the presence of ADH, Homer Smith must post the existence (in the distal part) of the more active components of water reabsorption, TX (H2O). In Figure 2, for example, the components that work with the gradient of osmotic pressure, about the relationship between the anatomical development of henle loops and the ability to focus on the kidneys in various mammals, Peter [5] and confirmed by I. Sperber [10], H. Smith's opinion is clear, 'This leads to the view that urine is concentrated in a thin part, but the thinness of the lining of the lining in this section is always difficult, and the latest work indicates that the function of this section is to promote the balance of osmotics before urine is delivered to the final distal part on water and sodium'. Physico-chemist Werner Kuhn (1899–1968) [11] That hypertonic urine production by the kidneys may be the result of a concentration mechanism by resisting the flow between the down limbs and the upward leg of hendel loops, as detailed later in 1951[12], the first experimental evidence supporting this revolutionary hypothesis was obtained at the University of Basel by swiss physiologists. Heinrich Wirz (1914–1993) (Figure 3) in conjunction with Kuhn, the study results were presented in Copenhagen by Wirz [13] as early as 1950 at the International Council on Physiology and published in 1951. [14] The authors measured under microscopic observation the melting temperature of urine crystals contained in the tubular structure of frozen kidney fragments (from dried mice) prepared at different levels according to the cortico-papillary axis in Figure 4, which illustrates their data, may be noticeable: (i). At the level defined by the osmotic pressure axis of the fluid, the tube is roughly similar in all structures: both limbs of loops and storage tubes, and (ii) where absolute values rise progressively from the isotonic to the cortico-medullary junction up to the last urine. The authors interpreted their data as evidence for the presence of cortico-medullary gradient of osmotic pressure tissue expected from the current counter-concentration multiplier mechanism. Open in a new tab Download Heinrich Wirz slide (1914–1993) Opened in a new tabDownload, the osmotic pressure slide of urine to collect the tube, and in two limbs of loops increased by medulla and papilla, as measured by cryometry in the frozen. [14] Homer Smith, who attended this meeting, declined to discuss the new theory, citing the cryoscopic method used as unreliable. However, if the tissue hypertonicity contained in the papilla, the walls of the vasa recta will face the difference of osmotic pressure with blood plasma, it is harder to determine than when this difference is located throughout the walls of the pipe collection, as well as in his own view of the concentration mechanism (Figure 2) Wirz (personal communication). Reject this argument by stating that in the current anti-hypothesis, the blood circulating in vasa recta should participate in osmotic gradients! In order to confirm this provocative aspect of the new theory, it appears that it is necessary to obtain direct access to the recta vasa to gather blood and measure plasma fluctuations. In Copenhagen, Sperber (who like Peter has examined henle loops in different species), mentions Wirz (personal communication) that this may be possible in the golden hamster, because in this species. Wirz conducts such experiments and measures the fluctuations of plasma samples in the blood and urine collected continuously in vasa recta and stores tubules at the papillary end of the golden hamster. Again, this additional evidence is not enough to convince the scientific community, except for german-speaking kidney physiologists. Opened in the new tabDownload slide, the osmotic pressure of blood plasma penetrated in the recta vasa at the papillary end of the golden hamster is high and similar to that of the adjacent urinary collection of the tube from Wirz, 1953 [15] in any case, the other two main aspects in this mechanism still have been established: (i) And (ii) what is the active process ('single effect') responsible for creating and maintaining the medullary gradient of osmotic pressure? Firstly, from 1955 onwards, Karl Ullrich and colleagues measured solutes and aninorganized ions contained in the renal cortex and medulla of dogs through various diuretic conditions[16], they noticed an increase in sodium chloride and urea content in the medulla of the dog during dehydration. They also identified the accumulation of small organic molecules containing phosphorus, which later proved to be glycerophosphorylcholine [17], such as the now famous kidney osmosis. The limbs of the loops associated with the spread of the back into thin down limbs should result in medulla internal thawing and may represent the necessary impetus in the current anti-hair mechanism. If this active process exists along the thicker limbs, these parts should transmit fluids. Hypotonic to distal convoluted tubules, which are characteristics that can be tested by experiments. In the end, Wirz had to restore a technique developed by Walker et al. [8] for rat kidneys in 1941 and never used after that. Figure 6 shows the results reported by Wirz in 1956 [18], the liquid is visibly hypotonic to the plasma early in the distal tube, both in dehydrated mice (currently ADH) and in the passing rat water pipe (ADH deficiency). Opened in a new tab, The Download slide of the osmotic pressure of the fluid, the tube drilled in the early distal tube is hypotonic, so the plasma in mice produced either diluted or concentrated urine from Wirz, 1956, [16]. So Homer Smith, in his excellent booklet, obtained the physiological principles of kidneys published in 1956 [19] does not mention the current anti-semitism hypothesis. I personally have met Heinrich Wirz several times over the years, and I can assure you how disappointed he is, especially for not being able to convince. Homer Smith.A a couple of years later in the United States, Carl Gottchalk (1922-1997) and his collaborators completed chapel hill in 1959, an incredible series of experiments. Gottchalk told me that he had the opportunity to send his data to Homer Smith at Chapel Hill before their full publication. Homer Smith was so impressed with the accumulated evidence that supported the current resistance mechanism that he felt was informed of his relevance and to get to know his new comments without delay in the incredible article in which he explained and detailed various aspects of the current resistance mechanism with both accuracy and humor! The publication of the results of Gottchalk et al. in the American Journal of Physiology [20] was postponed until an article by Homer Smith in the Proceedings of the New York Medical Institute [21] has appeared (Gottchalk, Personal Communications). What should be called homer smith conversion is a 'new theory', followed by most kidney physiologists, especially in the US. Homer Smith's original view on the urinary focus mechanism includes two weaknesses: firstly, it ignores Henle's loop, as mentioned above, and secondly it posts active water transport, what appears to be an irrelevant concept never confirmed in any of the This may be because the active water transport is not possible through the temperature at which the pipe loops developed during evolution in the terrestrial mammals to provide hypertonic urine production. Finally, the current opposition theory is completed and updated, rather than replacing the model of Homer Smith. Hyperosmotic urine continues to form in the medullary storage tube by abstract water (but by passive instead of active transport); Most of the thin parts are parts of passive osmotic balance (but in hypertonic instead of isotonic environments) and (iii) effects and sites of ADH's action remain unchanged. However, the blood plasma hypertonicity in the recta vasa, as defined by the new theory, corresponds to an unprecedented situation that may have contributed to Homer Smith's reluctance to accept it. It may be relevant, at this point, to cite Homer Smith's view in 1951 [3; p. XXII] about the controversy in kidney physiology.' It is a history of rival theories, each based on inconclusive evidence. Its error has been compounded by oversimplification in matters of theory and underexamination in the matter of critical investigation. Kidney physiology has gone through a quantitative phase where unsupported speculation and empirical explanations are no longer guaranteed.' On his side, Heinrich Wirz followed the advice of Claude Bernard [22]' When the observed evidence was contrary to the theory that there is now one must accept the information and surrender the theory, although it is supported by a famous and widely accepted name', apart from this controversy, henle's loop indirectly plays another important role in the recent history of the kidneys, as stated by Wirz, then Gottchalk et al. In the late 1950s, microbial techniques were needed to measure fluid fluctuations in pipes, so what was regarded as a rare technical achievement 20 years ago became in the 1960s, a method that was widely used and used regularly for experimental analysis of multi-sided kidney function. That is why the loops in Henle may be regarded as a turning point in the history of kidney physiology, referencing 1Henle J. Handbuch der Eingeweidelehre des Menschen. F. Vieweg und Sohn, Braunschweig, 1866: 3032Bernard C. 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