Suture characteristics

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There are five characteristics of any suture material that need to be considered: 1 Physical structure : monofilament or multifilament. /uni25CF Monofilament sutures are smooth and tend to slide through tissues easily , but are more di ffi cult to knot e ff ectively . Such material can be easily damaged by gripping it with a needle holder and this can lead to fracture of the suture. /uni25CF Multifilament or braided sutures are much easier to knot but have a surface area of several thousand times that of monofilament sutures and thus have a capillary be responsible for persistent infection or sinuses. To overcome some of these problems, certain materials are produced as a braided suture that is coated with silicone to make it smooth. 2 Strength : the strength of a suture depends upon its con stituent material, thickness and its response to various tissues and circumstances. Suture material thickness is clas sified according to its diameter in tenths of a millimetre. T he tensile strength of a suture can be expressed as the force required to br eak it when pulling the two ends apart. Absorbable sutures show decay of this strength with time. Although the material may last in the tissues for the stated period in the manufacturer's product profile, its tensile strength cannot be relied on in vivo for this entire period. Materials such as catgut (no longer in use in the UK) have a tensile strength of only about a week while polydioxanone sulphate (PDS) will remain strong in the tissues for several weeks . However, even non-absorbable sutures do not necessarily maintain their strength indefi nitely . Non-absorbable materials of synthetic origin, such as polypropylene, probably retain their tensile strength indefinitely , whereas non-absorbable materials of bio logical origin, such as silk, will fragment with time and lose their str ength, and such materials should never be used in vascular anastomoses for fear of late fistula formation. 3 Tensile behaviour : suture materials behave di ff erently depending upon their deformability and flexibility . Some may be 'elastic', in which case the material will return to its original length once any tension is released, while others may be 'plastic', in which case this phenomenon does not occur. Many synthetic materials demonstrate 'memory', which means they keep curling up in the shape that they adopted within the packaging. A sharp but gentle pull on the suture material helps to diminish this memory , but the more memory a suture material has, the less is the knot security . 4 Absorbability : suture materials may be non-absorbable (Table 7.1) or absorbable (Table 7.2). 5 Biological behaviour : the biological behaviour of suture materials within the tissues depends upon the con stituent raw material. Biological or natural sutures, such as catgut, are proteolysed, but this involves a process that is not entirely predictable and can cause local irritation; therefore , such materials are seldom used. Man-made syn thetic polymers are hydrolysed and their disappearance in the tissues is more predictable. The presence of pus, urine or faeces influences the final result and renders the out come more unpredictable. Suture characteristics

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