

AN IMPROVED PTB SUSPENSION STRAP

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It is the purpose of this article to describe an improved PTB suspension strap, which the author has fabricated on more than 100 occasions during the past 2 years with very satisfactory results. Although the modifications are seemingly minor, they are in each instance significant and contribute to more efficient functioning of the suspension component.

The basic PTB strap is attached to the medial and lateral wings of the prosthesis within an area dictated by established custom and the realities of dynamic alignment. The strap crosses above the superior border of the patella—and it is this part of the strap which functions as the primary suspension element. It is joined in the anterior midline by a circumferential strap (Fig. 1, A and B). It is the function of the latter to retract the lower suprapatellar suspension element when the patient flexes his knee on sitting.

A poorly conceived or poorly fitted PTB strap will have an adverse effect on gait and may produce a tourniquet effect sufficient to impair distal circulation. Most PTB straps have limited adjustability; i.e., the range of adjustability is as gross as the distance between strap eyeholes when the belt and buckle closure system is used (Fig. 1, A and B). Most straps are fabricated wholly of leather (Fig. 1B), which stretches with time and sometimes include an elastic section which stretches immediately (Fig. 1A). A strap is also available which is oversimplified to the degree that it is functionally inadequate; in the process of simplification it has lost the ability to be adequately adjusted (Fig. 1C). It tends to displace distally and it also produces a tourniquet effect upon sitting.

A properly fitted PTB prosthesis and PTB suspension strap should not require a waist belt and anterior support strap (Fig. 1B) for any purpose other than to provide the patient with a sense of security (blind patient, some bilaterals, etc.). Functionally, it should be unnecessary. A properly fitted strap should be comfortable, avoid sharp cutting

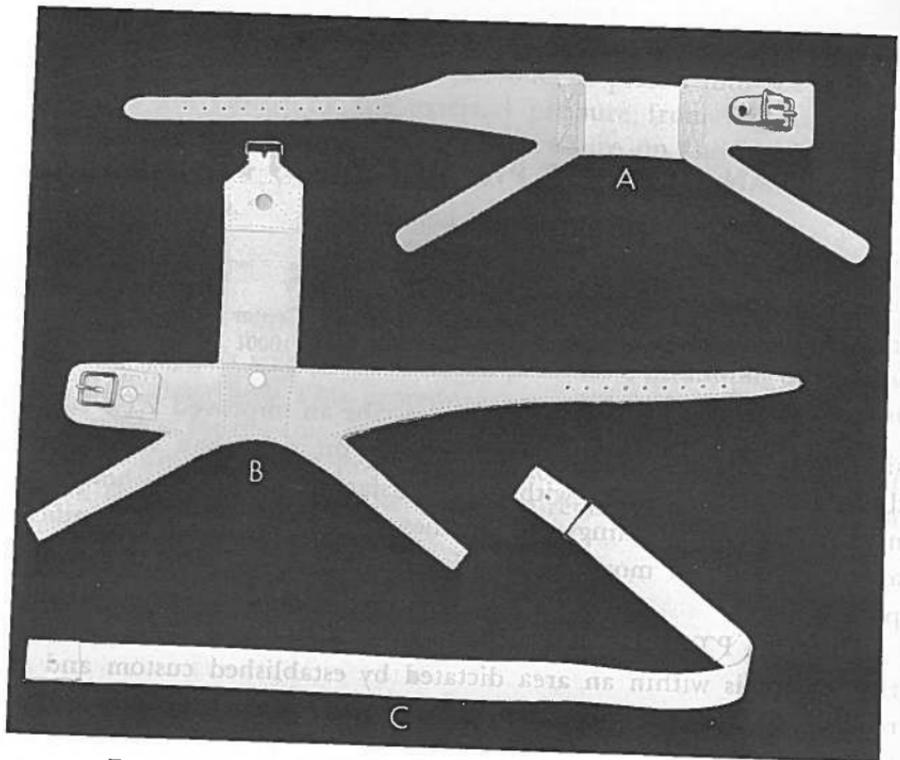


FIGURE 1.—Three types of PTB straps in common use (see text).

edges, minimize stretchability, and incorporate a closure which will allow for small increments of adjustability.

The strap used by the author as described below is shown in Figure 2:

1. A Velcro closure allows small increments of adjustability.
2. The extension of the leather border, which is in contact with the patella for $\frac{3}{8}$ in. distal to the edge of the suprapatellar cross-strap, introduces a flexible margin (rather than a sharp edge) in contact with the patella (Fig. 2, arrow).
3. The use of 5 oz. elk leather, which has relatively little stretch, for the central portion of the suspension system, plus Dacron webbing for the straps, reduces the extent of potential stretch as compared to those systems fabricated entirely of leather. The elk leather is pliable and comfortable.
4. The Velcro closure provides for small increments of adjustability of both upper and lower cuffs, particularly useful, for example, in instances when additional stump socks are required. The strap is comfortable and functionally efficient on standing (Fig. 3), and comfortable and relaxed on sitting (Fig. 4).

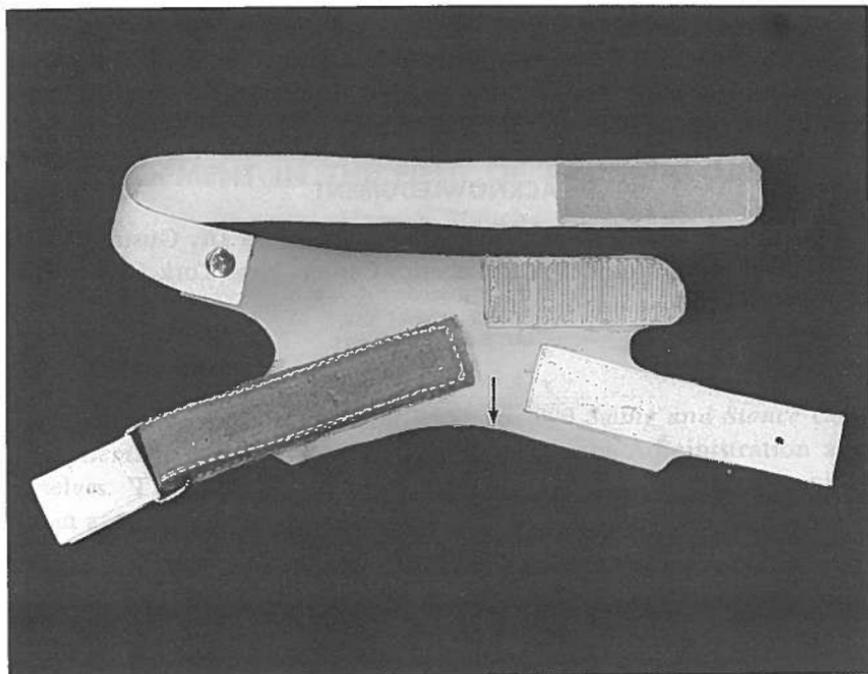


FIGURE 2.—The improved PTB suspension strap.



FIGURE 3.—Patient standing. Note conformity of PTB strap and suprapatellar snugness.



FIGURE 4.—Patient sitting. Note supra-patellar relaxation of strap.

SUMMARY

An improved PTB suspension strap has been described. This strap incorporates several new features and has had successful clinical applications.

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